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ANNUAL REPORT OF THE
GOVERNOR OF THE
PANAMA CANAL, 1946

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ANNUAL REPORT
OF THE
GOVERNOR OF
THE PANAMA CANAL
—
FOR THE
FISCAL YEAR
ENDED JUNE 30
1946



UNITED STATES
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OFFICIALS OF THE PANAMA CANAL AND PANAMA RAILROAD COMPANY

The following is a list of the major officials of The Panama Canal and the Panama Railroad Company as of June 30, 1946:

THE PANAMA CANAL

Maj. Gen. J. C. MEHAFFEY, USA, *Governor*

Brig. Gen. F. K. Newcomer, USA, Engineer of Maintenance.

J. G. Claybourn, Superintendent, Dredging Division.

Col. James H. Stratton, USA, Supervising Engineer, Special Engineering Division.

Commodore S. A. Manahan, USN, Marine Superintendent, Marine Division.

Col. F. H. Wang, AUS, Executive Secretary, Executive Department.

Col. Richardson Selee, USA, Assistant Engineer of Maintenance.

Capt. A. S. Pitre, USN, Superintendent, Mechanical Division.

Col. L. W. Lewis, AUS, Chief Quartermaster, Supply Department.

Arnold Bruckner, Comptroller, Accounting Department.

Brig. Gen. H. C. Dooling, USA, Chief Health Officer, Health Department.

B. F. Burdick, Chief of Washington Office and General Purchasing Officer.

PANAMA RAILROAD COMPANY

Maj. Gen. J. C. MEHAFFEY, USA, *President*

Brig. Gen. F. K. Newcomer, USA, Second Vice President.

A. L. Prather, General Manager.

(NEW YORK OFFICE)

T. H. Rossbottom, Vice President.

W. R. Pfizer, Third Vice President and Secretary.

W. L. Hall, Treasurer.

REPORTS OF HEADS OF DEPARTMENTS AND DIVISIONS

APPENDIXES NOT PRINTED

The material in the annual report of the Governor of The Panama Canal, published in this volume, is to a large extent a summary of the data presented in the annual reports from the heads of departments and divisions in the Canal organization; the latter, regarded as appendixes to the report of the Governor, are not printed. The annual reports of the Panama Railroad Company and the health department are published separately; the latter is compiled for calendar years only. The reports of the heads of departments and divisions, as listed below, are on file at the Washington Office of The Panama Canal and at the office of the Governor at Balboa Heights, C. Z.:

Engineer of maintenance, report of.

Dredging division, report of superintendent.

Plans section, report of chief.

Safety section, report of safety engineer.

Special engineering division, report of supervising engineer.

Assistant engineer of maintenance, report of.

Electrical division, report of electrical engineer.

Locks division, report of superintendent.

Meteorology and hydrography, section of, report of chief hydrographer.

Municipal engineering division, report of municipal engineer.

Office engineering division, report of office engineer.

Accounting department, report of comptroller.

Marine division, report of marine superintendent.

Mechanical division, report of superintendent.

Supply department, report of chief quartermaster.

Executive department:

Civil affairs, division of, report of chief.

Clubhouses, Panama Canal, report of acting director.

General counsel, report of.

License bureau, report of chief.

Personnel supervision and management, division of, report of director of personnel.

Police and fire division, report of chief.

Schools, division of, report of acting superintendent.

Surveying officer, acting, report of.

Aeronautics section, report of chief.

Collector, report of.

Magistrates' courts:

Magistrate:

Cristobal, report of.


Balboa, report of.

Pardon board, report of chairman.

Paymaster, acting, report of.

Public defender, report of.

Washington office, report of chief of office and general purchasing officer.



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ANNUAL REPORT
OF THE
GOVERNOR OF THE PANAMA CANAL

BALBOA HEIGHTS, C. Z.,
November 19, 1946.

The SECRETARY OF WAR,
Washington, D. C.

SIR: I have the honor to submit the report of the Governor of The Panama Canal for the fiscal year ended June 30, 1946.

Owing to the resumption of peacetime commerce early in the fiscal year and the consequent increase in traffic subject to the payment of tolls, operations for the year resulted in a net revenue of \$722,197, exclusive of the fixed capital charge. This net revenue contrasts with deficits recorded in each of the three preceding fiscal years, when the greater part of the Canal traffic was engaged in direct war service and therefore entitled to free passage of the Canal. With the exception of the fiscal years 1943 through 1945, during which period the value of the Canal was measured by its importance to the war effort rather than by the economic features of its operation, Canal revenues have exceeded operating expenses each year since 1921, when the waterway was declared officially open to commercial traffic. In seven of these years the net revenues exceeded the fixed capital charge of 3 percent, and the Canal operated at a surplus.

A major development during the year was the beginning of the investigation of means for increasing the capacity and security of the Panama Canal to meet the future needs of interoceanic commerce and national security, including a restudy of the Third Locks Project. This investigation is being conducted in accordance with Public Law No. 280, Seventy-ninth Congress, first session, approved December 28, 1945.

Respectfully,

J. C. MEHAFFEY, *Governor.*

INTRODUCTION

Administration of the affairs of The Panama Canal enterprises involves three main elements: (a) Operation and maintenance of the Canal itself; (b) operation of the auxiliary enterprises necessary to provide adequately for the needs of shipping and of the Canal operating forces; and (c) government of the Canal Zone, populated by American civilians, native or tropical workers and their families, and United States Army and Navy defense forces.

In addition to these normal elements, during the recent war period the Canal organization performed very important functions as a supply and service agency for the greatly expanded activities of the Army and Navy, particularly in their extensive construction programs. While the Canal organization and equipment were not

designed for this duty and were by no means fully adequate, the services rendered were regarded as very creditable. These services contributed materially to the efficiency and economy of the Army and Navy operations.

The immediate supervision of the administration of these various activities rests with the heads of the nine major departments and divisions. Responsibility for administrative control of the entire organization is centered in the Governor of The Panama Canal, who is also the president of the Panama Railroad Company, an adjunct of the Canal enterprise organized as a Government-owned corporation.

By Executive order of September 5, 1939, the provisions of section 13 of the Panama Canal Act, approved August 24, 1912, were invoked as an emergency measure, and since that date the commanding general, Panama Canal Department, United States Army, has exercised final authority over the operation of the Panama Canal and all its adjuncts, appendants, and appurtenances, including control and government of the Canal Zone; and the Governor of The Panama Canal has been subject to that authority and the orders issued under it.

OPERATION AND MAINTENANCE OF THE CANAL

The primary function of The Panama Canal is to provide and maintain a waterway by means of which vessels may make the transit from one ocean to the other, and to handle such traffic as presents itself for transit with a maximum of safety and a minimum of delay. Essentially this involves the maintenance of the waterway, the operation of the locks, and the control of traffic through the Canal. Throughout the year the Canal force maintained its high standard for expeditious service not only in the actual transiting of ships but in providing emergency repairs, fuel, supplies, and the various supplementary services incidental to shipping. There were no interruptions of ship traffic during the year.

OPERATION OF AUXILIARY ENTERPRISES—BUSINESS OPERATIONS

Second only to the operation of the Canal is the function of supplying necessary services to shipping and the Canal operating force. These services are provided under coordinated and centralized control by the various business units of The Panama Canal and Panama Railroad Company and include oil and coal bunkering plants; storehouses for food, ship chandlery, and other essential supplies; marine repair shops; harbor terminal facilities for passengers and for handling and transshipping cargo; a railroad line across the Isthmus; water and electric power systems; and living quarters and retail commissary stores for the operating force.

GOVERNMENT—ADMINISTRATION

The usual functions of government, such as schools, police and fire protection, quarantine, public health, immigration service, posts, customs, aids to navigation, steamboat inspection, hydrographic and meteorological work, water supply, sewers, construction and maintenance of streets, and similar activities, which, in the United States are

directed by various officers of the national, State, and municipal governments, are entrusted in the Canal Zone to the Governor, and are executed under his authority and responsibility. This centralization of all governmental activities under one head is essential to economical and efficient administration.

SERVICES RENDERED TO SHIPPING BY THE PANAMA CANAL

The principal services rendered to shipping by the Canal and its adjuncts are shown in the following table, which presents a comparison of the activities during the fiscal year 1946 with those of the 2 years immediately preceding:

	Fiscal year		
	1946	1945	1944
TRAFFIC THROUGH THE PANAMA CANAL			
Number of vessels transiting the Canal:			
Ocean-going tolls-paying vessels.....	3,747	1,939	1,562
Small tolls-paying vessels (see p. 27).....	285	361	235
Vessels exempt from payment of tolls (see p. 27).....	5,554	6,566	3,333
Total transits.....	9,586	8,866	5,130
Tolls levied:			
Ocean-going vessels.....	\$14,773,693	\$7,243,602	\$5,456,163
Small vessels.....	22,713	22,609	17,683
Total tolls.....	14,796,406	7,266,211	5,473,846
Cargo passed through Canal, carried by:	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>
Ocean-going tolls-paying vessels.....	14,977,940	8,603,607	7,003,487
Small tolls-paying vessels.....	19,776	20,883	17,156
Vessels exempt from payment of tolls.....	7,471,446	10,774,651	4,752,034
Total cargo.....	22,469,162	19,369,141	11,592,677
Net tonnage (Panama Canal measurement) of ocean-going tolls-paying vessels.....	17,516,517	8,380,959	6,073,457
Cargo per Panama Canal net vessel ton (laden ocean-going tolls-paying vessels only).....	1.295	1.402	1.389
Average tolls per ton of cargo (laden ocean-going tolls-paying vessels only).....	\$0.695	\$0.642	\$0.648
OTHER SERVICES			
Calls at Canal Zone ports by ships not transiting the Canal.....	1,044	1,273	813
Cargo handled and transferred at ports (tons).....	1,237,155	1,374,679	1,734,556
Coal sales to ships (tons).....	23,189	42,560	58,583
Coal, number of vessels bunkered.....	72	158	213
Fuel oil:			
Total barrels pumped (both incoming and outgoing), excluding Panama Canal use.....	30,431,970	32,180,658	23,688,710
Number of vessels handled.....	3,655	3,370	2,431
Repairs to ships other than Panama Canal equipment:			
Number of vessels repaired.....	3,186	4,303	3,514
Number of vessels drydocked.....	228	500	418
Sales to ships (except U. S. Army and Navy):			
Provisions (commissary sales).....	\$5,766,265	\$5,271,972	\$1,596,608
Chandlery (storehouse sales).....	\$313,678	\$447,886	\$337,577

NET REVENUES

During the fiscal year 1946 the revenues from tolls charged to shipping using the Canal were \$14,791,807.14, and civil revenues including profit from postal operations amounted to \$267,684.60. The net appropriation expenses were \$15,214,130.16, resulting in a net deficit in Canal operations proper of \$154,638.42. The business operations under The Panama Canal produced a net revenue of \$876,835.29.

Thus a net revenue of \$722,196.87 was derived from the combined operations of the Canal and its business units during the fiscal year 1946, as compared with a net deficit of \$4,974,915.75 in the fiscal year 1945.

The foregoing amounts for the fiscal year 1946 do not include charge for the capital loss of \$669,226.38 representing the unamortized value of water and sewerage systems and pavements in the Republic of Panama. Effective January 1, 1946, in conformity with Executive Order No. 9551 of May 16, 1945, and pursuant to the provisions of Public Law No. 48, approved May 3, 1943, all right, title, and interest of the United States in and to the water and sewerage systems in the cities of Panama and Colon were transferred to the Republic of Panama without further recovery of the construction costs from the Republic of Panama.

REPLACEMENTS

The past fiscal year marked the close of 32 years of successful operation of The Panama Canal. A very important factor contributing to this creditable record is the care that has been taken to maintain all parts of the Canal structures and equipment in good operating condition.

Of the total capital value of The Panama Canal, approximately \$118,000,000 is the value of property of the transit divisions (which is subject to deterioration). Some of this property, including locks, dams, and other concrete structures, is still in excellent condition and requires but little expenditure for upkeep. However, other types of property, subject to more rapid deterioration, require systematic and orderly replacement as their economic life is exhausted, and appropriations must be made by Congress for this purpose, as well as for the construction of new facilities as the need therefor develops.

SECTION I

CANAL OPERATION AND TRADE VIA THE PANAMA CANAL STATISTICS ON CANAL TRAFFIC

Total transits of the Panama Canal in the fiscal year ended June 30, 1946, including vessels on which tolls were assessed and those transiting free of tolls, numbered 9,586. This is the greatest number of transits for any fiscal year in the history of the Canal and exceeds the previous record fiscal year's traffic (1945) by 8.1 percent. The following table presents a segregation of this traffic by direction of transit, together with the totals for the fiscal year 1945 and 1944:

	Fiscal year 1946			Fiscal year	
	Atlantic to Pacific	Pacific to Atlantic	Total	1945 total	1944 total
Tolls-paying transits:					
Ocean-going vessels ¹	1, 516	2, 231	3, 747	1, 939	1, 562
Local vessels ²	135	150	285	361	235
Total tolls-paying transits.....	1, 651	2, 381	4, 032	2, 300	1, 797
Tolls-free transits.....	2, 239	3, 315	5, 554	6, 566	3, 333
Grand total transits.....	3, 890	5, 696	9, 586	8, 866	5, 130

¹ Vessels of 300 net tons and over (Panama Canal measurement) for vessels rated on net tonnage, or 500 tons displacement and over for vessels rated on displacement tonnage.

² Vessels under 300 net tons (Panama Canal measurement) for vessels rated on net tonnage, or under 500 tons displacement for vessels rated on displacement tonnage.

As will be observed from the foregoing table there was a sharp increase in the movement of ocean-going traffic subject to the payment of tolls, the number of tolls-paying vessels passing through in the fiscal year 1946 (3,747) being almost double the number transiting in the preceding fiscal year. The volume of traffic in this category began to increase immediately following the cessation of hostilities in the Pacific, reflecting corresponding increases in the number of vessels transferred from war service, under Government control, to peacetime commerce under private owners and operators.

The peak of the tolls-free traffic for 1946 was reached in the early part of the year immediately preceding the end of the war in the Pacific, and while this shipping continued to be an important element in Canal traffic throughout the year it declined steadily during the closing months. The peak month for tolls-free transits was July with 733 and the lowest month was June with 221.

The Panama Canal does not compile detailed statistics on the cargo or routing of tolls-free vessels. In normal times tolls-free traffic consists largely of war ships, which do not carry cargo, and supply vessels of the Army and Navy. Since the fiscal year 1946 was

partially a war year, cargo carried in tolls-free vessels continued at a high level with 7,471,446 long tons. About 67 percent of this cargo transited during the first 3 months of the year. Ninety-three percent of the cargo passing through the Canal in tolls-free vessels in 1946 was routed from the Atlantic to the Pacific.

The following data show the total amount of cargo carried through the Canal since the fiscal year 1939 segregated as to that carried by tolls-paying and by tolls-free vessels:

Fiscal year	Total	Tolls-paying		Tolls-free
		Ocean-going	Local ¹	
	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>	<i>Tons</i>
1939.....	27,993,143	27,866,627	31,251	95,265
1940.....	27,523,727	27,299,016	25,818	198,893
1941.....	25,198,599	24,950,791	24,881	222,927
1942.....	14,187,080	13,607,444	12,999	566,637
1943.....	11,030,105	10,599,966	11,059	419,080
1944.....	11,592,677	7,003,487	17,156	4,572,034
1945.....	19,369,141	8,603,607	20,883	10,744,651
1946.....	22,469,162	14,977,940	19,776	7,471,446

¹ Vessels under 300 net tons, Panama Canal measurement.

Except for the sections appearing under the captions "Small tolls-paying vessels transiting Canal" and "Vessels entitled to free transit" on page 27, the following discussion of traffic through the Panama Canal in the fiscal year 1946 pertains only to ocean-going tolls-paying traffic.

OCEAN-GOING TOLLS-PAYING TRAFFIC

A total of 3,747 ocean-going tolls-paying vessels transited the Canal in the fiscal year ended June 30, 1946, which is an increase of 1,808 transits, or 93 percent, in comparison with the fiscal year 1945, and an increase of 2,185 transits, or 140 percent, compared with the fiscal year 1944. The total number of ocean-going tolls-paying transits in 1946 was about 79 percent of the number of corresponding transits during the fiscal year 1941, which immediately preceded the entry of the United States into the war. The following figures show the principal features of ocean-going tolls-paying traffic through the Canal in the past 3 fiscal years:

	Fiscal year		
	1946	1945	1944
Number of transits.....	3,747	1,939	1,562
Net tonnage (Panama Canal measurement).....	17,516,517	8,380,959	6,073,457
Cargo carried (tons of 2,240 pounds).....	14,977,940	8,603,607	7,003,487
Tolls.....	\$14,773,693	\$7,243,602	\$5,456,163

The combined movement of cargo in both directions in 1946 amounted to 14,977,940 tons, which was 40 percent below the volume passing through in 1941, and 46.3 percent under the volume in 1939.

(NOTE.—Since 1946 was, for the most part, a peacetime year, comparisons throughout the discussion on the movement of cargo are made with the fiscal year 1941, which immediately preceded the entry of the United States into the war, and the fiscal year 1939, which ended just prior to the outbreak of war in Europe.)

The Atlantic-to-Pacific cargo movement in 1946, totaling 6,118,085 tons, was 35.5 and 32.1 percent lower, respectively, than the corresponding movement in 1941 and 1939, while the Pacific-to-Atlantic cargo movement, totaling 8,859,855 tons, showed a decline of 42.7 and 53.0 percent, respectively, as compared with shipments in 1941 and 1939. A noteworthy development during 1946 was the revival of the United States intercoastal trade which was virtually dormant during the war. In 1946 a total of 1,652,934 tons was shipped through the Canal in this trade, 865,510 tons from the Atlantic to the Pacific and 787,424 tons from the Pacific to the Atlantic. These shipments were about 25 percent of the totals shipped in each of the fiscal years 1941 and 1939.

In tables appearing on pages 10 to 19 will be found a comparison of cargo tonnage shipped over the various trade routes, together with summaries of the principal commodities comprising these shipments. In the Atlantic-to-Pacific movement, shipments from eastern United States to the west coast of South America and to Australasia were at considerably higher levels than in 1941 and 1939, while shipments from the United States to Asia totaled only 765,164 tons in 1946 as compared with 3,082,897 tons in 1941 and 2,593,808 tons in 1939. The type of cargo routed to Asia during the fiscal year was substantially different from that carried in 1941 and 1939. A large part of the cargoes shipped in 1946 consisted of relief supplies (food products, cotton, etc.), whereas in 1941 and 1939 they consisted largely of metals, chemicals, iron and steel manufactures, mineral oils, and phosphates. Shipments from Europe, which reached 1½ million tons via the Canal in 1939, amounted to 331,291 tons in 1946, the larger portion of which was routed to Australasia.

In the Pacific-to-Atlantic movement, shipments from North and South America attained considerable volume in 1946. Much of the cargo shipped from western United States and Canada (36 percent of the total east-bound cargo) consisted of consignments of food products and other items for the United Nations Relief and Rehabilitation Administration. Shipments from Australasia to the United States were considerably above those of 1939 and closely approached those of 1941; shipments from Australasia to Europe were less than half of the shipments in 1941 and about 60 percent of the 1939 shipments. Cargo tonnage originating in Asia (including the Philippine Islands), which aggregated some 3 million tons in 1941 and 1.5 million tons in 1939, totaled approximately 50,000 tons in 1946.

The receipts from tolls as reported to the United States Treasury for the fiscal year 1946 were \$14,791,807.14. This figure includes tolls amounting to \$22,713.16 on local tolls-paying vessels which are not included in the Canal statistics covering ocean-going tolls-paying traffic. The tolls receipts reported to the United States Treasury, moreover, reflect adjustments for overcharges and undercollections which in 1946 amounted to \$4,599. These two items account for the difference of \$18,114.16 between the tolls receipts reported to the Treasury and the figure for tolls levied on ocean-going tolls-paying traffic as shown in the following studies of traffic, which are based on tolls levied at the time of transit.

CANAL TRAFFIC BY FISCAL YEARS 1915 TO 1946

Comparative traffic statistics covering ocean-going vessels for each fiscal year since the Canal was opened to navigation are shown in the following table:

Fiscal year ended June 30—	Number of transits	Panama Canal net tonnage ¹	Tolls	Tons of cargo
1915 ²	1,058	3,507,000	\$4,366,747.13	4,888,400
1916 ³	724	2,212,000	2,403,089.40	3,093,335
1917.....	1,738	5,357,000	5,620,799.83	7,054,720
1918.....	1,989	6,072,000	6,428,780.26	7,525,768
1919.....	1,948	5,658,000	6,164,290.79	6,910,097
1920.....	2,393	7,898,000	8,507,938.68	9,372,374
1921.....	2,791	10,550,000	11,268,681.46	11,595,971
1922.....	2,665	10,556,000	11,191,828.56	10,882,607
1923.....	3,908	17,206,000	17,504,027.19	19,566,429
1924.....	5,158	24,181,000	24,284,659.92	26,993,167
1925.....	4,592	21,134,000	21,393,718.01	23,956,549
1926.....	5,087	22,906,000	22,919,931.89	26,030,016
1927.....	5,293	24,245,000	24,212,250.61	27,733,555
1928.....	6,253	27,229,000	26,922,200.75	29,615,651
1929.....	6,289	27,585,000	27,111,125.47	30,647,768
1930.....	6,027	27,716,000	27,059,998.94	30,018,429
1931.....	5,370	25,690,000	24,624,599.76	25,065,283
1932.....	4,362	21,842,000	20,694,704.61	19,798,986
1933.....	4,162	21,004,000	19,601,077.17	18,161,165
1934.....	5,234	26,410,000	24,047,183.44	24,704,009
1935.....	5,180	25,720,000	23,307,062.93	25,309,527
1936.....	5,382	25,923,000	23,479,114.21	26,505,943
1937.....	5,387	25,430,000	23,102,137.12	28,108,375
1938.....	5,524	25,950,383	23,169,888.70	27,385,924
1939.....	5,903	27,170,007	23,661,021.08	27,866,627
1940.....	5,370	24,144,366	21,144,675.36	27,299,016
1941.....	4,727	20,642,736	18,157,739.68	24,950,791
1942.....	2,688	11,010,004	9,752,207.38	13,607,444
1943.....	1,822	8,233,999	7,356,684.94	10,599,966
1944.....	1,562	6,073,457	5,456,163.22	7,003,487
1945.....	1,939	8,380,959	7,243,601.58	8,603,607
1946.....	3,747	17,516,517	14,773,692.98	14,977,940
Total.....	126,272	565,243,428	536,931,623.15	605,832,926

¹ Panama Canal net tonnages prior to 1939 are estimated figures based on revised measurement rules which became effective Mar. 1, 1938.

² Canal opened to traffic Aug. 15, 1914.

³ Canal closed to traffic approximately 7 months of fiscal year by slides.

TRAFFIC BY MONTHS—FISCAL YEARS 1946 AND 1945

The ocean-going tolls-paying traffic during each month of the fiscal year 1946 is summarized in the following table, in which are inserted for comparison the corresponding figures for the preceding year:

	Number of transits		Panama Canal net tonnage		Tons of cargo		Tolls	
	1945-46	1944-45	1945-46	1944-45	1945-46	1944-45	1945-46	1944-45
July.....	198	129	892,685	495,823	851,525	548,904	\$803,850.98	\$446,205.86
August.....	249	140	1,189,121	577,507	1,032,203	661,917	1,007,925.08	510,325.02
September.....	261	139	1,253,731	535,728	924,191	554,970	1,017,571.32	460,442.60
October.....	334	145	1,484,986	589,822	846,683	632,756	1,176,159.60	513,403.78
November.....	308	183	1,391,717	719,178	908,219	775,499	1,132,256.62	615,680.66
December.....	348	161	1,610,133	708,277	1,133,596	708,676	1,325,131.68	599,137.56
January.....	366	163	1,797,745	688,627	1,359,083	713,020	1,489,975.22	595,471.98
February.....	319	139	1,540,707	586,074	1,352,585	639,167	1,299,338.82	514,147.54
March.....	357	170	1,692,507	830,899	1,687,867	797,039	1,457,698.20	720,501.92
April.....	345	159	1,650,296	736,684	1,681,693	702,558	1,423,058.34	626,099.46
May.....	342	192	1,601,770	900,039	1,761,693	843,865	1,411,503.78	772,390.62
June.....	300	219	1,411,119	1,012,301	1,438,602	1,025,236	1,229,232.34	869,794.58
Total.....	3,747	1,939	17,516,517	8,380,959	14,977,940	8,603,607	14,773,692.98	7,243,601.58
Average per month.....	312	162	1,459,709	698,413	1,248,162	716,967	1,231,141.08	603,633.46

NATIONALITY OF VESSELS TRANSITING CANAL

Segregation of ocean-going tolls-paying traffic¹ through the Canal during the fiscal year 1946, by nationality, is presented in the following table, which shows the number of transits, measurement tonnage, tolls, and tons of cargo:

Nationality	Number of transits	Measured tonnage			Tolls	Tons of cargo
		Panama Canal net	Registered			
			Gross	Net		
Argentine.....	4	18,714	17,560	10,019	\$16,842.60	6,630
Belgian.....	3	20,118	28,207	16,832	16,757.10	23,166
British.....	751	3,859,699	5,297,886	3,190,533	3,373,695.76	3,606,015
Chilean.....	53	153,840	215,669	137,574	142,321.18	209,447
Chinese.....	9	41,464	53,535	34,457	36,208.26	39,384
Costa Rican.....	10	6,830	10,680	6,199	5,901.12	9,055
Danish.....	20	58,590	63,141	37,074	51,664.86	47,716
Ecuadoran.....	6	5,718	6,720	3,132	5,146.20	6,110
French.....	9	35,695	44,994	26,439	33,454.00	29,706
Greek.....	4	18,577	18,841	11,221	14,373.72	9,326
Honduran.....	230	510,796	838,931	483,334	420,467.40	203,833
Mexican.....	15	22,326	33,086	20,227	19,032.14	19,973
Netherlands.....	167	299,050	352,064	205,689	253,045.98	204,590
Norwegian.....	225	1,033,295	1,264,772	753,567	849,994.02	864,940
Panamanian.....	153	590,085	803,966	477,565	483,893.28	510,708
Peruvian.....	7	12,587	17,899	10,271	11,328.30	13,620
Philippine Islands.....	1	4,892	5,011	2,978	4,402.80	1,869
Polish.....	1	5,121	7,176	4,380	4,608.90	9,216
Portuguese.....	10	55,457	60,098	37,660	45,934.02	52,181
Soviet.....	7	20,375	29,363	17,451	18,337.50	19,637
Spanish.....	30	109,830	147,426	89,031	89,645.22	104,747
Swedish.....	45	205,885	276,614	188,586	176,533.56	177,271
United States.....	1,983	10,413,147	14,314,288	8,562,614	8,687,887.38	8,790,676
Venezuelan.....	2	8,508	11,070	6,692	6,891.48	7,524
Yugoslav.....	2	5,918	7,248	4,640	5,326.20	10,600
Totals:						
1946.....	3,747	17,516,517	23,926,245	14,338,165	14,773,692.98	14,977,940
1945.....	1,939	8,380,959	11,426,602	6,922,805	7,243,601.58	8,603,607
1944.....	1,562	6,073,457	8,048,116	4,862,402	5,456,163.32	7,003,487

VESSELS PAYING TOLLS ON DISPLACEMENT TONNAGE

In the Canal traffic statistics, foreign naval vessels such as transports, supply ships, tankers, etc., with a measurement of 300 net tons (Panama Canal measurement) or more, and vessels of war, dredges, etc., with a displacement of 500 tons or more, are classified as ocean-going tolls-paying vessels. Statistics on these vessels, except such as pertain to displacement tonnage, have been included in the traffic summaries shown on the preceding pages. Since displacement tonnage cannot be combined with net tonnage, the following table presents statistics covering 42 vessels, the majority of which were vessels of war, which transited the Canal during the fiscal year 1946 and paid tolls on displacement tonnage.

Nationality	Number of transits	Displacement tonnage	Tolls
British.....	34	147,347	\$73,673.50
Chilean.....	6	9,089	4,544.50
French.....	1	2,657	1,328.50
Mexican.....	1	1,651	825.50
Total.....	42	160,744	80,372.00

¹ Includes only vessels of 300 or more net tons, Panama Canal measurement, or 500 or more displacement tons on vessels rated on displacement tonnage.

ORIGIN AND DESTINATION OF CARGO ²

The following tables present, by direction of movement, the origin and destination of cargo passing through the Canal, together with the principal commodities making up these shipments, for the fiscal year 1946 and, for comparison, corresponding figures for the fiscal years 1941 and 1939.

The use of the standard cargo declaration form, which for security reasons was discontinued for the duration of the war effective June 30, 1943, was resumed in November 1945. Except for the period July 1, 1943, to October 31, 1945, the cargo declaration form required of ships' masters has formed the basis of the commodity statistics since 1920, when such data were first compiled. The cargo declaration is an itemized statement listing the tonnage of the principal items of cargo carried and showing port (or country) of origin and destination.

The tables below include only cargo carried by ocean-going toll-paying vessels.

TOTAL CARGO SHIPMENTS

ATLANTIC TO PACIFIC

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
East coast United States to—			
West coast United States.....	865,510	2,947,549	2,391,523
West coast Canada.....	40,497	20,590	22,292
West coast Central America/Mexico.....	24,755	52,423	31,710
West coast South America.....	609,705	456,335	192,732
Hawaiian Islands.....	118,824	227,795	141,804
Australasia.....	609,679	416,292	374,544
Philippine Islands.....	265,380	257,425	277,399
Asia.....	765,164	3,082,897	2,593,808
Balboa, C. Z.....	24,942	77,599	8,514
Total from east coast United States.....	3,324,456	7,538,905	6,034,326
East coast Canada to—			
West coast Canada.....	5,182	11,594	46,893
Australasia.....	164,060	142,780	222,720
Asia.....	14,979	10,700	50,943
Other territories.....	629	13,626	27,854
Total from east coast Canada.....	184,850	178,700	348,410
East coast Central America/Mexico to—			
West coast Central America/Mexico.....	16,937	29,431	74,857
Asia.....	20,603	115,565	21,757
Other territories.....	5,916	20,486	21,938
Total from east coast Central America/Mexico.....	43,456	165,482	118,552
East coast South America to—			
West coast United States.....	72,761	152,603	110,521
West coast Canada.....	51,858	7,979	6,202
West coast South America.....	28,312	51,917	152,649
Asia.....		222,759	124,724
Other territories.....	11,657	4,740	12,943
Total from east coast South America.....	164,588	439,998	407,039

² Comparative figures for the fiscal years 1939 and 1941 are shown for the purpose of providing a comparison between cargo movements during the past fiscal year and those for the year immediately preceding the outbreak of hostilities in Europe and those immediately preceding the entry of the United States into the war.

TOTAL CARGO SHIPMENTS—Continued

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
Cristobal, Canal Zone to—			
West coast Central America/Mexico.....	49,048	51,804	50,907
West coast South America.....	19,310	139,500	135,986
Other territories.....	10,893	25,383	26,854
Total from Cristobal.....	79,251	216,687	213,747
West Indies to—			
West coast United States.....	58,974	3,440	10,064
West coast Central America/Mexico.....	155,900	16,609	15,342
West coast South America.....	651,020	255,884	177,714
Balboa, C. Z.....	795,354	130,823	65,307
Australasia.....	315,353	20,219	21,942
Asia.....		64,374	19,892
Other territories.....	13,592	11,696	8,673
Total from West Indies.....	1,990,193	503,045	318,934
Europe to—			
West coast United States.....	18,061	23,354	337,401
West coast Canada.....	4,062	47,607	78,789
West coast Central America/Mexico.....	2,258		91,873
West coast South America.....	88,651	102,694	415,697
Australasia.....	207,177	219,657	542,770
Asia.....	2,183	48,625	35,419
Other territories.....	8,899		23,849
Total from Europe.....	331,291	441,937	1,525,798
Asia and Africa to—			
Other territories.....		3,692	44,461
Total cargo—Atlantic to Pacific.....	6,118,085	9,488,446	9,011,267

PACIFIC TO ATLANTIC

West Coast United States to—			
East coast United States.....	787,424	3,933,753	4,493,203
East coast South America.....	64,546	64,272	45,222
Cristobal, C. Z.....	2,825	107,856	55,073
West Indies.....	83,240	147,498	487,189
Europe.....	1,650,726	433,660	2,349,888
Africa.....	36,050	71,120	44,859
Other territories.....	13,035	32,320	46,151
Total from west coast United States.....	2,637,846	4,790,479	7,521,585
West Coast Canada to—			
East coast United States.....		50,962	201,619
Europe.....	1,527,995	1,114,069	2,539,436
Africa.....	201,252	137,812	26,910
Other territories.....	27,742	64,030	105,487
Total from west coast Canada.....	1,756,989	1,366,873	2,873,452
West Coast Central America/Mexico to—			
East coast United States.....	256,487	126,119	30,649
Other territories.....	56,634	32,645	92,941
Total from west coast Central America/Mexico.....	313,121	158,764	123,590
West coast South America to—			
East coast United States.....	1,997,815	2,961,992	2,447,257
East coast Canada.....	17,071	30,363	132,364
Cristobal, Canal Zone.....	33,598	150,092	143,186
West Indies.....	59,852	55,509	103,903
Europe.....	970,455	429,064	2,481,541
Africa.....	131,658		24,180
Other territories.....	60,840	12,514	12,684
Total from west coast South America.....	3,271,289	3,639,534	5,345,115

TOTAL CARGO SHIPMENTS—Continued

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
From Balboa, C. Z.—Total.....		2, 813	
Hawaiian Islands to—			
East coast United States.....	101, 823	581, 355	361, 857
Europe.....		12, 651	79, 174
Total from Hawaiian Islands.....	101, 823	594, 006	441, 031
Australasia to—			
East coast United States.....	237, 679	266, 592	86, 999
East coast Canada.....	31, 945	150, 939	87, 546
Europe.....	457, 812	1, 162, 503	759, 794
Other territories.....	13	12, 377	12, 001
Total from Australasia.....	727, 449	1, 592, 411	946, 340
Philippine Islands to—			
East coast United States.....	31, 256	1, 512, 890	918, 937
Other territories.....		11, 905	2, 525
Total from Philippine Islands.....	31, 256	1, 524, 795	921, 462
Asia to—			
East coast United States.....	20, 082	1, 640, 278	250, 593
Europe.....			363, 048
Other territories.....		152, 392	39, 144
Total from Asia.....	20, 082	1, 792, 670	682, 785
Total cargo—Pacific to Atlantic.....	8, 859, 855	15, 462, 345	18, 855, 360

ORIGIN AND DESTINATION OF PRINCIPAL COMMODITIES

ATLANTIC TO PACIFIC

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
East coast United States to west coast United States—			
Canned goods, various.....	23, 696	119, 461	94, 119
Chemicals, unclassified.....	14, 160	53, 537	48, 743
Iron and steel manufactures.....	322, 734	1, 237, 651	784, 485
Mineral oils.....	98, 939	140, 281	138, 689
Paper and paper products.....	44, 848	125, 027	129, 607
Sulfur.....	27, 159	146, 396	133, 017
Tinplate.....	2, 569	50, 025	67, 839
All other and unclassified.....	331, 405	1, 075, 171	995, 024
Total.....	865, 510	2, 947, 549	2, 391, 523
East coast United States to west coast Canada—			
Sulfur.....	25, 600	2, 300	4, 000
All other and unclassified.....	14, 897	18, 290	18, 292
Total.....	40, 497	20, 590	22, 292
East coast United States to west coast Central America/Mexico— (No single outstanding commodity in this trade.)			
East coast United States to west coast South America—			
Automobiles and accessories.....	32, 374	19, 727	13, 223
Cement.....	20, 502	22, 991	2, 544
Chemicals, unclassified.....	14, 902	13, 743	3, 607
Coal.....	29, 216	90, 434	2, 023

ORIGIN AND DESTINATION OF PRINCIPAL COMMODITIES—Continued

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
East coast United States to west coast South America—Continued			
Iron and steel manufactures.....	106,987	108,207	63,719
Lubricating oil and greases.....	16,691	15,526	13,975
Machinery.....	34,080	22,125	16,473
Paper and paper products.....	15,717	15,416	905
All other and unclassified.....	339,236	148,166	76,263
Total.....	609,705	456,335	192,732
East coast United States to Hawaiian Islands—			
Iron and steel.....	13,231	41,095	21,015
Tinplate.....	33,215	55,970	37,916
All other and unclassified.....	72,378	130,730	82,873
Total.....	118,824	227,795	141,804
East coast United States to Australasia—			
Automobiles and accessories.....	7,135	23,526	51,839
Iron and steel manufactures.....	7,879	26,047	15,805
Machinery.....	3,591	11,893	9,856
Mineral oils.....	88,238	79,950	67,844
Paper and paper products.....	17,005	7,987	5,193
Phosphates.....	138,280	818	—
Sulfur.....	102,200	123,754	95,637
Tinplate.....	28,782	719	383
Tobacco and manufactures.....	11,318	6,797	14,546
All other and unclassified.....	205,251	134,801	113,441
Total.....	609,679	416,292	374,544
East coast United States to Philippine Islands—			
Flour.....	14,690	4,340	2,179
Iron and steel manufactures.....	19,932	74,696	96,497
Refrigerated meat.....	13,694	3	—
Rice.....	47,052	—	362
All other and unclassified.....	170,012	178,386	178,361
Total.....	265,380	257,425	277,399
East coast United States to Asia—			
Automobiles and accessories.....	45,397	44,836	42,865
Canned goods, various.....	35,645	17,932	705
Chemicals, unclassified.....	15,560	32,304	9,518
Copper (metal).....	2,063	94,028	40,615
Cotton, raw.....	204,537	65,969	175,934
Flour.....	48,589	3,296	2,917
Iron (in pigs).....	218	77,406	197,872
Iron and steel manufactures.....	43,755	501,256	208,562
Lead (metal).....	116	50,724	13,772
Machinery.....	11,508	69,118	38,520
Mineral oils.....	88,887	720,508	298,289
Paper and paper products.....	16,325	87,628	3,335
Phosphates.....	3,762	250,184	139,197
Railroad material.....	8,829	15,367	10,343
Rice.....	22,161	—	100
Scrap metal.....	80	390,079	1,152,844
Tinplate.....	4,098	50,805	33,027
Tobacco.....	11,464	36,936	32,265
Wheat.....	28,855	225	2,267
All other and unclassified.....	173,315	574,296	190,861
Total.....	765,164	3,082,897	2,593,808
East coast United States to Balboa, C. Z.—			
Mineral oils.....	13,316	25,598	3,051
All other and unclassified.....	11,626	52,001	5,463
Total.....	24,942	77,599	8,514
East coast Canada to west coast Canada— (No single outstanding commodity in this trade.)			

ORIGIN AND DESTINATION OF PRINCIPAL COMMODITIES—Continued

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
East coast Canada to Australasia—			
Automobiles and accessories	12, 444	10, 503	26, 070
Paper and paper products	96, 405	85, 842	139, 836
All other and unclassified	55, 211	46, 435	56, 814
Total	164, 060	142, 780	222, 720
East coast Canada to Asia— (No single outstanding commodity in this trade.)			
East coast Central America/Mexico to west coast Central America/ Mexico—			
Mineral oils	16, 443	27, 119	63, 287
All other and unclassified	494	2, 312	11, 570
Total	16, 937	29, 431	74, 857
East coast Central America/Mexico to Asia:			
Lead (metal)		33, 228	
Mineral oils	19, 249	79, 280	21, 757
All other and unclassified	1, 354	3, 057	
Total	20, 603	115, 565	21, 757
East coast South America to west coast United States:			
Coffee	46, 231	54, 870	45, 113
All other and unclassified	26, 530	97, 733	65, 408
Total	72, 761	152, 603	110, 521
East coast South America to west coast Canada:			
Mineral oils	51, 669		
All other and unclassified	189	7, 979	6, 202
Total	51, 858	7, 979	6, 202
East coast South America to west coast South America:			
Mineral oils	155	29, 398	131, 008
All other and unclassified	28, 157	22, 519	21, 641
Total	28, 312	51, 917	152, 649
East coast South America to Asia:			
Cotton		100, 167	71, 545
All other and unclassified		122, 592	53, 179
Total		222, 759	124, 724
Cristobal, C. Z., to west coast Central America/Mexico: (No single outstanding commodity in this trade.)			
Cristobal, C. Z., to west coast South America: (No single outstanding commodity in this trade.)			
West Indies to west coast United States:			
Mineral oils	33, 180		
All other and unclassified	25, 794	3, 440	10, 064
Total	58, 974	3, 440	10, 064
West Indies to west coast Central America/Mexico:			
Mineral oils	155, 380	16, 609	15, 269
All other and unclassified	520		73
Total	155, 900	16, 609	15, 342
West Indies to west coast South America:			
Mineral oils	613, 531	251, 113	165, 573
Sugar	25, 599	3, 962	11, 423
All other and unclassified	11, 890	809	718
Total	651, 020	255, 884	177, 714

ORIGIN AND DESTINATION OF PRINCIPAL COMMODITIES—Continued

ATLANTIC TO PACIFIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
West Indies to Balboa:			
Mineral oils.....	786, 400	130, 823	65, 307
All other and unclassified.....	8, 954		
Total.....	795, 354	130, 823	65, 307
West Indies to Australasia:			
Asphalt.....	14, 994	9, 955	3, 453
Mineral oils.....	277, 172	10, 264	
All other and unclassified.....	23, 187		18, 489
Total.....	315, 353	20, 219	21, 942
West Indies to Asia—			
Salt.....		59, 323	
All other and unclassified.....		5, 051	19, 892
Total.....		64, 374	19, 892
Europe to west coast United States—			
Iron and steel manufactures.....	9	33	44, 164
Paper and paper products.....		5	44, 558
All other and unclassified.....	18, 052	23, 316	248, 679
Total.....	18, 061	23, 354	337, 401
Europe to west coast Canada— (No single outstanding commodity in this trade.)			
Europe to west coast Central America/Mexico— (No single outstanding commodity in this trade.)			
Europe to west coast South America—			
Cement.....	3, 461	8, 070	54, 337
Chemicals, unclassified.....	3, 457	9, 567	16, 004
Iron and steel manufactures.....	8, 997	8, 552	72, 989
All other and unclassified.....	72, 736	76, 505	272, 367
Total.....	88, 651	102, 694	415, 697
Europe to Australasia—			
Chemicals, unclassified.....	1, 363	9, 191	11, 897
Iron and steel manufactures.....	10, 621	30, 255	101, 345
Machinery.....	7, 408	16, 508	26, 060
Salt.....	5, 633	17, 603	31, 149
All other and unclassified.....	182, 152	146, 100	372, 319
Total.....	207, 177	219, 657	542, 770
Europe to Asia—			
Potash.....		17, 181	
Salt.....		21, 550	
All other and unclassified.....	2, 183	9, 894	35, 419
Total.....	2, 183	48, 625	35, 419

PACIFIC TO ATLANTIC

West coast United States to east coast United States—			
Asphalt.....	11	42, 784	64, 113
Beans, dried.....	1, 357	53, 261	68, 922
Canned goods, various.....	104, 934	742, 595	735, 122
Flour, wheat.....	28, 652	97, 627	115, 597
Fruit, dried.....	4, 113	131, 021	157, 016
Lumber.....	260, 260	1, 452, 871	1, 521, 200
Mineral oils.....	110, 374	756, 901	810, 051
Paper and paper products.....	10, 795	69, 738	81, 382
Sugar.....	6, 180	101, 195	140, 044
Wood pulp.....	18, 297	99, 883	188, 777
All other and unclassified.....	242, 451	385, 877	610, 979
Total.....	787, 424	3, 933, 753	4, 493, 203

ORIGIN AND DESTINATION OF PRINCIPAL COMMODITIES—Continued

PACIFIC TO ATLANTIC

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
West coast United States to east coast South America— (No single outstanding commodity in this trade.)			
West coast United States to Cristobal, C. Z.—			
Mineral oils		58,458	32,955
All other and unclassified	2,825	49,398	22,118
Total	2,825	107,856	55,073
West coast United States to West Indies—			
Mineral oils	183	23,602	401,358
Rice	19,353	25,458	17,308
Canned goods, various	19,523	23,023	13,045
All other and unclassified	44,181	75,415	55,478
Total	83,240	147,498	487,189
West coast United States to Europe—			
Barley	10,694		136,713
Borax	9,138	25,217	66,598
Canned goods, various	218,788	46,764	225,723
Coal	180,724		149
Coke	44,081	27	38
Cotton, raw	132	2,768	17,647
Flour, wheat	25,221		8,314
Fruit:			
Dried	50,412	8,432	161,102
Fresh	16,231	1,841	319,176
Grains, unclassified	43,303		1,650
Iron and steel manufactures	67,555	25	113
Lumber	429,389	194,681	159,535
Mineral oils	9,313	29,109	605,776
Metals:			
Lead	19,591		750
Other and unclassified	58,459	75	22,196
Wheat	266,917	64,466	528,454
Wood pulp	8,551	32,825	22,478
All other and unclassified	192,227	27,430	73,476
Total	1,650,726	433,660	2,349,888
West coast United States to Africa—			
Lumber	12,380	29,400	33,762
Wheat	11,652		
All other and unclassified	12,018	41,720	11,097
Total	36,050	71,120	44,859
West coast Canada to east coast United States—			
Lumber		35,313	167,856
All other and unclassified		15,649	33,763
Total		50,962	201,619
West coast Canada to Europe—			
Barley, oats and other grains	46,389	2,000	109,545
Canned goods, various	50,905	43,221	26,269
Lumber	449,566	816,836	1,136,276
Metals:			
Lead	40,910	82,614	117,875
Zinc	16,907	87,666	67,827
Wheat	825,806	60,100	972,584
Wood pulp	8,610	11,454	5,825
All other and unclassified	88,902	10,178	103,235
Total	1,527,995	1,114,069	2,539,436
West coast Canada to Africa—			
Lumber	66,735	122,632	21,283
Wheat	118,239		
All other and unclassified	16,278	15,180	5,627
Total	201,252	137,812	26,910

ORIGIN AND DESTINATION OF PRINCIPAL COMMODITIES—Continued

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
West coast Central America/Mexico to east coast United States—			
Bananas	234,335	116,860	25,801
All other and unclassified	22,152	9,259	4,848
Total	256,487	126,119	30,649
West coast South America to east coast United States—			
Coffee	198,288	29,811	24,242
Metals:			
Copper	119,366	290,091	82,959
Lead	11,189	28,184	2,139
Mineral oils		41,867	
Nitrates	490,097	535,776	546,352
Ores:			
Copper	138,670	46,750	15,169
Iron	588,585	1,687,070	1,612,801
Manganese	130,193	16,965	191
Tin	50,515	10,643	380
Zinc	131,360	44,227	18,089
Other and unclassified	19,745	32,371	25,347
Sugar	50,113	79,606	42,117
All other and unclassified	159,694	118,631	77,471
Total	1,997,815	2,961,992	2,447,257
West coast South America to east coast Canada—			
Mineral oils	15,540	30,360	126,461
All other and unclassified	1,531	3	5,903
Total	17,071	30,363	132,364
West coast South America to Cristobal, Canal Zone—			
Coffee	9,281	110,985	93,785
All other and unclassified	24,317	39,107	49,401
Total	33,598	150,092	143,186
West coast South America to West Indies—			
Beans	10,280	4,145	8,923
Mineral oils		17,660	79,249
Nitrates	21,136	10,714	447
Rice	16,322	732	
All other and unclassified	12,114	22,258	15,284
Total	59,852	55,509	103,903
West coast South America to Europe—			
Barley	2,537		55,329
Beans, dried	8,916	21,167	52,663
Cotton, raw	51,275	10,106	65,115
Metals:			
Copper	59,570		235,363
Lead	11,177		28,726
Mineral oils	44,927	79,998	679,000
Nitrates	667,960	213,326	864,384
Oilseeds		220	65,013
Ores:			
Copper	15,568		21,813
Lead			43,823
Tin	18,893	38,360	42,492
Zinc	9,516	2,121	28,073
Other and unclassified	21,305	1,338	29,899
Sugar	15,860	29,985	132,563
All other and unclassified	42,951	32,443	137,285
Total	970,455	429,064	2,481,541
West coast South America to Africa—			
Nitrates	131,658		24,180
(No other commodities in this trade.)			

ORIGIN AND DESTINATION OF PRINCIPAL COMMODITIES—Continued

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
Hawaiian Islands to east coast United States—			
Canned fruit.....	65,204	239,322	129,683
Sugar.....	30,173	307,849	208,208
All other and unclassified.....	6,446	34,184	23,966
Total.....	101,823	581,355	361,857
Hawaiian Islands to Europe—			
Molasses.....		12,651	79,174
(No other commodities in this trade.)			
Australasia to east coast United States—			
Metals: Lead.....	11,282	13,206	
Ores:			
Chrome.....	31,077	39,158	8,744
Lead.....	10,981	2,846	
Manganese.....			24,518
Zinc.....	13,453		
Other and unclassified.....	10,850	4,225	7,019
Skins and hides.....	18,472	23,670	16,540
Wheat.....	21,565	76,302	
Wool.....	59,206	65,135	13,375
All other and unclassified.....	60,793	42,050	16,803
Total.....	237,679	266,592	86,999
Australasia to east coast Canada—			
Sugar.....		95,709	63,816
All other.....	31,945	55,230	23,730
Total.....	31,945	150,939	87,546
Australasia to Europe—			
Copra.....	4,310	13,140	82,147
Dairy products.....	60,287	280,596	145,913
Fruit, dried.....	7,754	13,174	311
Meat, refrigerated.....	192,991	291,772	168,720
Metal, lead.....	11,346	23,773	13,078
Ores:			
Chrome.....	13,000		5,500
Zinc.....	13,897	23,133	16,526
Other and unclassified.....	10,932	755	16,525
Phosphates.....		15,100	87,160
Sugar.....		172,679	83,079
Tallow.....	8,616	26,140	16,157
Wheat.....	28,644	93,159	5,326
Wool.....	13,303	95,786	68,886
All other and unclassified.....	92,732	113,296	50,466
Total.....	457,812	1,162,503	759,794
Philippine Islands to east coast United States—			
Coconut oil.....		144,432	106,680
Copra.....		70,312	65,531
Hemp, unmanufactured.....	11,842	49,415	15,588
Ores:			
Chrome.....	6,000	140,029	18,650
Manganese.....		65,346	
Other and unclassified.....		9,067	8,000
Sugar.....		955,191	579,691
All other and unclassified.....	13,414	79,098	124,797
Total.....	31,256	1,512,890	918,937
Asia to east coast United States—			
Flour, sago.....		134,701	166
Hemp, unmanufactured.....		61,996	1,598
Metal, tin.....		88,145	2,002
Oils, vegetable.....	10	105,810	27,306
Ores:			
Magnesite.....		35,341	1,673
Manganese.....		21,414	3,002
Tin.....		12,216	860
Other and unclassified.....		91,141	663

ORIGIN AND DESTINATION OF PRINCIPAL COMMODITIES—Continued

PACIFIC TO ATLANTIC—Continued

[Tons of 2,240 pounds]

	Fiscal year		
	1946	1941	1939
Asa to east coast United States—Continued			
Rubber, crude.....	17,769	743,827	20,615
Spices.....	125	22,474	1,145
Tea.....	88	27,966	8,678
Textiles.....	165	21,358	16,843
All other and unclassified.....	1,925	273,889	196,042
Total.....	20,082	1,640,278	280,593
Asia to Europe—			
Canned fish.....			50,364
Soya beans.....			224,621
All other.....			88,063
Total.....			363,048

CLASSIFICATION OF VESSELS BETWEEN LADEN AND BALLAST TRAFFIC

The following table summarizes the ocean-going tolls-paying traffic through the Canal during the fiscal year 1946 showing laden ships and those in ballast, and further segregated as to tankers, ore ships, passenger-carrying ships, general cargo ships, and those not designed to carry cargo, and also as to vessels of United States registry and those of all other nationalities:

OTHER TYPE SHIPS									
Naval vessels:									
Number of transits.....									1,42
Displacement tonnage.....									160,744
Tolls.....									\$80,373
Cable ships:									
Number of transits.....	1	1	2	1	1	1	1	1	4
Panama Canal net tonnage.....	752	762	1,514	2,259	2,259	4,518	3,011	3,021	6,032
Tolls.....	\$677	\$686	\$1,363	\$2,033	\$2,033	\$4,066	\$2,710	\$2,719	\$5,429
SUMMARY									
Total cargo and cargo-passenger ships, laden:									
Number of transits.....	511	757	1,268	524	685	1,209	1,035	1,442	2,477
Panama Canal net tonnage.....	2,758,657	3,853,282	6,611,939	2,381,267	2,564,255	4,945,522	5,139,924	6,417,537	11,557,461
Tolls.....	\$2,482,791	\$3,407,953	\$5,950,744	\$2,143,140	\$2,307,830	\$4,450,970	\$4,625,931	\$5,775,783	\$10,401,714
Cargo (tons).....	3,347,254	5,443,422	8,790,676	2,770,831	3,416,433	6,187,264	6,118,085	8,859,855	14,977,940
Total cargo and cargo-passenger ships, ballast:									
Number of transits.....	85	628	713	360	151	511	445	779	1,224
Panama Canal net tonnage.....	394,115	3,405,579	3,799,694	1,373,560	779,764	2,153,330	1,767,681	4,185,343	5,953,024
Tolls.....	\$283,763	\$2,452,017	\$2,735,780	\$988,967	\$561,430	\$1,550,397	\$1,272,730	\$3,013,447	\$4,286,177
Total other type ships:									
Number of transits.....	1	762	1,514	35	9	44	36	10	46
Panama Canal net tonnage.....	752			2,259	2,259	4,518	3,011	3,021	6,032
Displacement tonnage.....				101,257	59,487	160,744	101,257	59,487	160,744
Tolls.....	\$677	\$686	\$1,363	\$32,662	\$31,777	\$84,439	\$53,339	\$32,463	\$85,802
Grand total ships:									
Number of transits.....	597	1,386	1,983	919	845	1,764	1,516	2,231	3,747
Panama Canal net tonnage.....	3,153,524	7,259,623	10,413,147	3,757,092	3,346,278	7,103,370	6,910,616	10,605,991	17,516,517
Displacement tonnage.....				101,257	59,487	160,744	101,257	59,487	160,744
Tolls.....	\$2,767,231	\$5,920,656	\$8,687,887	\$3,184,769	\$2,901,037	\$6,085,806	\$5,952,000	\$8,821,693	\$14,773,933
Cargo (tons).....	3,347,254	5,443,422	8,790,676	2,770,831	3,416,433	6,187,264	6,118,085	8,859,855	14,977,940

1 Includes 1 dredge of 1,651 tons displacement, tolls \$925.50.

LADEN AND BALLAST TRAFFIC BY NATIONALITY

In the table below, the ships of each nationality have been segregated to show separate statistics on vessels which were carrying cargo and/or passengers at the time of transiting the Canal and those which transited in ballast:

Nationality	Laden			Ballast		
	Number of transits	Panama Canal net tonnage	Tolls	Number of transits	Panama Canal net tonnage	Tolls
Argentine.....	4	18,714	\$16,842.60			
Belgian.....	2	12,623	11,360.70	1	7,495	\$5,396.40
British.....	521	2,894,661	2,605,194.90	196	965,038	694,827.36
Chilean.....	46	150,066	135,059.40	1	3,774	2,717.28
Chinese.....	8	35,301	31,770.90	1	6,163	4,437.36
Costa Rican.....	8	5,464	4,917.60	2	1,366	983.52
Danish.....	19	52,667	47,400.30	1	5,923	4,264.56
Ecuadorian.....	6	5,718	5,146.20			
French.....	8	35,695	32,125.50			
Greek.....	1	5,546	4,991.40	3	13,031	9,382.32
Honduran.....	134	292,746	263,471.40	96	218,050	156,996.00
Mexican.....	11	11,844	10,659.60	3	10,482	7,547.04
Netherland.....	143	209,611	188,649.90	24	89,439	64,396.08
Norwegian.....	132	589,009	530,108.10	93	444,286	319,885.92
Panamanian.....	92	327,956	295,160.40	61	262,129	188,732.88
Peruvian.....	7	12,587	11,328.30			
Philippine Islands.....	1	4,892	4,402.80			
Polish.....	1	5,121	4,608.90			
Portuguese.....	6	33,361	30,024.90	4	22,096	15,909.12
Soviet.....	7	20,375	18,337.50			
Spanish.....	16	58,709	52,838.10	14	51,121	36,807.12
Swedish.....	35	157,202	141,481.80	10	48,683	35,051.76
United States.....	1,270	6,613,453	5,952,107.70	713	3,799,694	2,735,779.68
Venezuelan.....	1	4,254	3,828.60	1	4,254	3,062.88
Yugoslav.....	2	5,918	5,326.20			
Totals:						
1946.....	2,481	11,563,493	10,407,143.70	1,224	5,953,024	4,286,177.28
1945.....	1,427	6,137,095	5,523,385.50	471	2,243,864	1,615,582.08
1944.....	1,237	5,041,735	4,538,485.98	267	1,031,722	742,839.84

AVERAGE TONNAGE, TOLLS, AND TONS OF CARGO PER CARGO-CARRYING VESSEL

The average measurement tonnage, tolls, and tons of cargo per cargo-carrying vessel of 300 net tons and over, Panama Canal measurement, transiting the Panama Canal during the past 3 fiscal years, are shown in the following table:

	Fiscal years		
	1946	1945	1944
Measured tonnage:			
Panama Canal net.....	4,728	4,416	4,038
Registered gross.....	6,458	6,020	5,351
Registered net.....	3,870	3,647	3,233
Tolls.....	\$3,988	\$3,816	\$3,628
Tons of cargo (including vessels in ballast).....	4,043	4,533	4,657
Tons of cargo (laden vessels only).....	6,037	6,029	5,662

STEAM, MOTOR, AND OTHER VESSELS

The following table shows ocean-going tolls-paying vessels transiting the Canal during each of the past 3 fiscal years, segregated according to the method of propulsion:

	Fiscal years		
	1946	1945	1944
Steamers:			
Oil burning.....	2,729	1,182	738
Coal burning.....	224	118	160
Motor ships.....	748	586	593
Not classified ¹	46	53	71
Total.....	3,747	1,939	1,562

¹ Indicates vessels not engaged in commerce.

FREQUENCY OF TRANSITS OF VESSELS THROUGH THE PANAMA CANAL

During the fiscal year 1946, 1,952 individual ocean-going tolls-paying vessels, representing 25 nationalities, passed through the Panama Canal. In the aggregate these vessels made a total of 3,747 transits. The number of transits made by individual ships varied from 1 to 34, and averaged 1.92. The small motor vessel *Dido*, plying between the Atlantic terminus of the Canal and the west coast of South America, and the steamer *Iriona*, engaged in the banana trade between Gulf ports of the United States and Central America, made 34 transits each.

Vessels of United States registry led in the number of individual vessels transiting the Canal during the year with 1,226, as well as in the number of transits—1,983; those of British registry were second in number of both individual vessels and of transits, with 433 and 751, respectively.

The following table shows the number of individual ships, the frequency of transits per ship, the total number of transits for the year, and the average number of transits per individual ship, segregated by nationality:

Vessels making indicated number of transits during fiscal year 1946

Nationality	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	19	20	21	22	23	24	25	26	28	33	34	36	37	38	40	53	55	58	63	Total ships	Total trans- ships	Trans- ships per ship
Argentine.....	2	1																																		3	4	1.33	
Belgian.....	1	1																																		2	3	1.50	
British.....	262	99	32	20	9	10				1																									433	751	1.73		
Chilean.....	10	2	1				3	1																											19	53	2.79		
Chinese.....	9																																		9	9	1.00		
Costa Rican.....																																			1	10	10.00		
Danish.....	7			3	1																													11	20	1.82			
Ecuadorian.....	6			1																														1	6	6.00			
French.....	4																																		7	9	1.29		
Greek.....	4																																		4	4	1.00		
Honduran.....	3	3		2	5			2	1	3	2	1																						26	230	8.85			
Mexican.....	1	1	1	1																														5	15	3.00			
Netherlands.....	12	9	3	2			1																											31	167	5.39			
Norwegian.....	30	28	3	9	2																													78	225	2.88			
Panamanian.....	19	10	3	5			1	1	1																									44	153	3.48			
Peruvian.....				1																														2	7	3.50			
Philippine Islands.....	1																																		1	1	1.00		
Polish.....	1																																		1	1	1.00		
Portuguese.....			1		1																													3	10	3.33			
Soviet.....	7																																		7	7	1.00		
Spanish.....	1	9	1	2																														13	30	2.31			
Swedish.....	11	3	2	3																														22	45	2.05			
United States.....	907	163	51	42	28	17	3	6	4	1																								1,226	1,983	1.62			
Venezuelan.....																																			1	2	2.00		
Yugoslav.....	2																																		2	2	1.00		
Total 1946.....	1,290	333	104	89	46	31	7	11	6	6	2	2	1	1	2	2	2	1	2	2	1	2	1	2										1,952	3,747	1.92			
Total 1945.....	357	211	53	54	15	17	6	9	5	5	1	5	1																					750	1,939	2.59			
Total 1944.....	518	133	28	26	15	7	3	5	3	3																								750	1,562	2.08			

The following tabulation compiled from the preceding table shows the number of vessels making a given number of transits through the Panama Canal (1 to 34), their aggregate number of transits, and their percent of the total ocean-going tolls-paying transits:

Number of transits	Number of vessels	Total number of transits	Percent total Canal transits (3,747)	Number of transits	Number of vessels	Total number of transits	Percent of total Canal transits (3,747)
1.....	1, 296	1, 296	34. 6	14.....	1	14	0. 4
2.....	333	666	17. 7	15.....	2	30	. 8
3.....	104	312	8. 3	16.....	2	32	. 9
4.....	89	356	9. 5	19.....	2	38	1. 0
5.....	46	230	6. 1	20.....	2	40	1. 1
6.....	31	186	5. 0	21.....	1	21	. 6
7.....	7	49	1. 3	22.....	2	44	1. 2
8.....	11	88	2. 3	23.....	1	23	. 6
9.....	6	54	1. 4	24.....	2	48	1. 3
10.....	6	60	1. 6	33.....	1	33	. 9
11.....	2	22	. 6	34.....	2	68	1. 8
12.....	2	24	. 6				
13.....	1	13	. 4	Total.....	1, 952	3, 747	100. 00

GROSS TONNAGE OF VESSELS

The 3,747 ocean-going tolls-paying vessels which transited the Canal in the fiscal year 1946 included 3,701 merchant vessels, 4 cable-repair ships paying tolls on the basis of net tonnage, and 42 vessels paying tolls on the basis of displacement tonnage.

Of the 3,705 vessels paying on net tonnage, 2,056, or approximately 56 percent were vessels ranging between 6,000 to 8,000 registered gross tons. This group was made up to a large extent of Liberty and Victory type vessels designed for war use. The average registered gross tonnage of all vessels was 6,458 as compared with 6,020 in the fiscal year 1945, representing an average increase per vessel in registered gross tonnage of 7.3 percent.

The following tabulation shows the ocean-going tolls-paying vessels, excluding those rated on displacement tonnage, in groups according to registered gross tonnage, segregated by nationality, with average tonnages for 1946 and 1945 and group percentages for the fiscal year 1946:

Segregation of transits by registered gross tonnage of vessels, fiscal year 1946—Continued

Segregation of transits by registered gross tonnage of vessels, fiscal year 1946

Nationality	Under 2,000	2,000 to 3,999	4,000 to 5,999	6,000 to 7,999	8,000 to 9,999	10,000 to 11,999	12,000 to 13,999	14,000 to 15,999	16,000 to 17,999	18,000 to 19,999	20,000 and over	Total	Registered gross tonnage	Average gross tonnage per vessel	
														1946	1945
Argentine.....	2	---	---	---	2	---	---	---	---	---	---	4	17,560	4,390	7,114
Belgian.....	---	---	---	---	---	---	---	---	---	---	---	3	28,207	9,402	10,568
British.....	14	18	96	449	73	39	15	2	5	---	6	717	5,297,886	7,389	7,879
Chilean.....	6	9	32	---	---	---	---	---	---	---	---	47	215,669	4,589	3,574
Chinese.....	---	3	---	4	2	---	---	---	---	---	---	9	53,535	5,948	---
Costa Rican.....	10	---	---	---	---	---	---	---	---	---	---	10	10,680	1,068	1,068
Danish.....	13	2	2	1	2	---	---	---	---	---	---	20	63,141	3,157	9,823
Ecuadorian.....	6	---	---	---	---	---	---	---	---	---	---	6	6,720	1,120	1,120
French.....	---	2	3	1	2	---	---	---	---	---	---	8	44,994	5,624	---
Greek.....	---	1	3	---	---	---	---	---	---	---	---	4	18,841	4,710	6,183
Honduran.....	27	137	54	12	---	---	---	---	---	---	---	230	838,931	3,648	3,014
Mexican.....	11	---	---	3	---	---	---	---	---	---	---	14	33,086	2,363	1,782
Netherlands.....	119	9	8	21	8	2	---	---	---	---	---	167	352,064	2,108	895
Norwegian.....	14	63	74	19	31	24	---	---	---	---	---	225	1,264,772	5,621	6,808
Panamanian.....	19	55	15	29	29	6	---	---	---	---	---	153	803,966	5,355	5,456
Peruvian.....	---	7	---	---	---	---	---	---	---	---	---	7	17,899	2,557	2,724
Philippine Islands.....	---	---	1	---	---	---	---	---	---	---	---	1	5,011	5,011	---
Polish.....	---	---	---	---	---	---	---	---	---	---	---	1	7,176	7,176	7,176
Portuguese.....	---	---	5	1	---	---	---	---	---	---	---	10	60,098	6,010	6,100
Soviet.....	---	4	2	---	---	---	---	---	---	---	---	7	29,363	4,195	5,052
Spanish.....	---	6	21	3	---	---	---	---	---	---	---	30	147,426	4,914	4,049
Swedish.....	23	5	87	13	---	2	---	---	---	---	---	45	276,614	6,147	7,204
United States.....	47	52	57	1,491	181	122	2	2	---	---	1	1,983	14,314,288	7,219	7,071
Uruguayan.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4,509
Venezuelan.....	---	---	2	---	---	---	---	---	---	---	---	2	11,070	5,535	4,413
Yugoslavian.....	---	2	---	---	---	---	---	---	---	---	---	2	7,248	3,624	3,149
Total.....	288	375	428	2,056	328	197	17	4	5	---	7	3,705	23,926,245	6,458	6,020
Percent of total.....	7.7	10.1	11.6	55.5	8.9	5.3	0.5	0.1	0.1	---	0.2	100	---	---	---

142 vessels rated on displacement tonnage (34 British, 6 Chilean, 1 French and 1 Mexican) are not included.

SMALL TOLLS-PAYING VESSELS TRANSITING CANAL

Transits of small cargo-carrying vessels and other small miscellaneous craft of less than 300 net tons (Panama Canal measurement) or 500 displacement tons (for vessels rated on displacement tonnage) are excluded from statistics on ocean-going tolls-paying traffic, although the vessels are not exempt from the payment of tolls. Transits of these small vessels during the year, together with the tonnage, tolls, and amount of cargo carried, are summarized in the following table:

	Fiscal year 1946			Total fiscal year	
	Atlantic to Pacific	Pacific to Atlantic	Total	1945	1944
Number of transits:					
Rated on net tonnage.....	135	145	280	361	209
Rated on displacement tonnage.....		5	5		26
Total transits.....	135	150	285	361	235
Panama Canal net tonnage.....	11,672	14,922	26,594	27,394	18,015
Displacement tonnage.....		1,970	1,970		5,833
Tolls.....	\$9,775.44	\$12,937.72	\$22,713.16	\$22,609.16	\$17,682.98
Cargo (tons).....	10,723	9,053	19,776	20,883	17,156

VESSELS ENTITLED TO FREE TRANSIT

Naval and other vessels owned and operated in the Government service of the United States and Republic of Panama, war vessels of the Republic of Colombia, and vessels transiting solely for the purpose of having repairs made at the Canal shops, are exempt from the payment of tolls, and such vessels are not included in the general transit statistics pertaining to Canal traffic.

In normal times free transits comprise but a relatively small part of the total Canal traffic (less than 9 percent in 1939), but the war brought about a great expansion of such traffic. In 1946, 5,554 tolls-free vessels were passed through, these comprising approximately 58 percent of the total transits. Approximately 60 percent of these 5,554 vessels were routed from the Pacific to the Atlantic.

The following tabulation shows for the past 3 years the number of tolls-free vessels passing through the Canal, their tonnage, the approximate amount of tolls to which they would have been subject at the prescribed rates if tolls had been charged against them, and the tons of cargo carried by such vessels:

	Fiscal year 1946			Total fiscal year—	
	Atlantic to Pacific	Pacific to Atlantic	Total	1945	1944
Number of transits:					
On net tonnage basis.....	1,596	1,576	3,172	3,739	2,107
On displacement tonnage basis.....	643	1,739	2,382	2,827	1,226
Total transits.....	2,239	3,315	5,554	6,566	3,333
Tonnage:					
Panama Canal net.....	5,808,934	6,855,809	12,664,743	11,328,776	5,303,061
Displacement.....	2,031,970	7,391,758	9,423,728	7,493,480	2,903,783
Approximate value of tolls.....	\$6,287,427	\$8,974,660	\$15,262,087	\$13,171,772	\$5,876,729
Cargo (tons).....	6,943,495	527,951	7,471,446	10,744,651	4,572,034

Full information on naval and other vessels owned and operated in the Government service of the United States, including naval supply ships manned and operated by the Navy, is not required by The Panama Canal at the time of their transit. For these vessels estimates are made of the displacement tonnage or the Panama Canal net tonnage and the consequent value of tolls. No attempt is made to estimate cargo tonnage carried by naval supply ships, which comprise only a minor part of the total non-tolls-paying cargo-carrying vessels.

CANAL OPERATION AND MAINTENANCE

HOURS OF OPERATION

Dispatching of ships through the Canal is conducted on schedules. Vessels awaiting transit begin moving through the Canal from the terminal ports at 6 a. m. and dispatches are made thereafter from each terminus at intervals of from one-half to 1 hour. The following is a summary of normal arrangements in effect at the end of the fiscal year.

From Cristobal Harbor, first ship at 6 a. m., last at about 3 p. m.; from Balboa anchorage, first ship at 6 a. m., last at 3:30 p. m.

Tankers and vessels carrying hazardous cargoes are dispatched at the discretion of the port captain and normally are not permitted to proceed unless they can clear Gaillard Cut before dark.

LOCKAGES AND LOCK MAINTENANCE

The number of operating crews on Gatun Locks was reduced from four to three on June 30, 1946 and on Miraflores Locks from four to three on April 26, 1946. The following operating schedules were in effect at the Locks on June 30, 1946:

Gatun:

- Shift No. 1: 7:00 a. m. to 3:00 p. m.—8 locomotives.
- 2: 10:00 a. m. to 6:00 p. m.—8 locomotives.
- 3: 3:00 p. m. to 11:00 p. m.—8 locomotives.

Pedro Miguel:

- Shift No. 1: 8:00 a. m. to 4:00 p. m.—8 locomotives.
- 2: 9:30 a. m. to 5:30 p. m.—8 locomotives.
- 3: 2:00 p. m. to 10:00 p. m.—8 locomotives.

Miraflores:

- Shift No. 1: 7:00 a. m. to 3:00 p. m.—8 locomotives.
- 2: 9:30 a. m. to 5:30 p. m.—8 locomotives.
- 3: 3:00 p. m. to 11:00 p. m.—8 locomotives.

LOCKAGES

The number of lockages and vessels handled (including Panama Canal equipment) is shown in the following table, by months, for the fiscal year 1946, with corresponding totals for the previous 5 years:

Month	Gatun		Pedro Miguel		Miraflares	
	Lockages	Vessels	Lockages	Vessels	Lockages	Vessels
<i>1945</i>						
July.....	625	982	666	1,052	649	1,007
August.....	664	1,004	700	1,077	689	1,033
September.....	621	899	654	945	656	946
October.....	647	899	679	958	680	971
November.....	579	749	593	789	594	806
December.....	577	801	599	850	596	861
<i>1946</i>						
January.....	632	951	648	988	643	1,004
February.....	574	883	600	998	587	964
March.....	537	808	569	912	560	886
April.....	458	647	490	727	485	727
May.....	475	655	492	704	489	697
June.....	434	623	449	654	448	659
Total.....	6,823	9,901	7,139	10,654	7,076	10,561
Fiscal year:						
1941.....	5,103	8,018	5,018	7,489	4,943	7,410
1942.....	4,669	10,986	4,445	8,084	3,775	5,806
1943.....	2,796	5,236	3,661	6,672	3,395	5,934
1944.....	3,267	5,846	4,036	7,632	3,656	6,424
1945.....	5,261	9,201	6,263	12,334	5,635	10,057

The heavy traffic through the Canal during the final months of the war in the Pacific produced new monthly records for the number of lockages at all locks. After exceeding all previous records in July, the number of lockages increased still further in August, the totals for that month being the highest recorded to date. Record figures prior to July 1945 were: Gatun, 610, established January 1929; Pedro Miguel, 619, established November 1944; and Miraflares, 592, established December 1927.

The average number of lockages made daily, and the average number of vessels handled per lockage during each of the past 5 fiscal years are shown in the following table:

Fiscal year	Average number of lockages per day			Average number of vessels per lockage		
	Gatun	Pedro Miguel	Miraflares	Gatun	Pedro Miguel	Miraflares
1942.....	12.8	12.1	10.3	2.35	1.82	1.54
1943.....	7.7	10.0	9.3	1.87	1.82	1.75
1944.....	8.9	11.1	10.0	1.79	1.89	1.76
1945.....	14.4	17.1	15.4	1.74	1.96	1.79
1946.....	18.7	19.5	19.4	1.45	1.49	1.49

DELAYS TO SHIPPING

The lock operating machinery functioned smoothly throughout the year except for a few incidents due to faulty operation or minor failures of equipment. The following summary includes all delays to vessels while transiting the locks due to the incidents mentioned:

	Number of lockages delayed	Aggregate delay caused all vessels
Gatun.....	36	7 hours 18 minutes.
Pedro Miguel.....	18	5 hours 50 minutes.
Miraflares.....	31	7 hours 2 minutes.
Total.....	85	20 hours 10 minutes.

MAINTENANCE

Regular inspection and preventive maintenance were continued for all locks' machinery and equipment. Routine tests and inspections were regularly carried out with a view to detecting weak points and potential failures before breakdowns occurred. Where inspection and tests indicated that a mechanical or electrical part or device was in need of replacement or repair, such replacement or repair was made by the operation and maintenance forces of the locks.

Inasmuch as special improvement projects were under way on the locks during the past several years, regular overhaul periods were impracticable, and the normal schedule which called for major overhauls at the Pacific locks in 1941 and the Atlantic locks in 1943 was not adhered to. Minor overhauls were performed at all locks during this period, however, and sufficient work was done to insure safe operation until the regular periodic overhauls might be resumed. In 1946 both sides of all locks were in continuous operation, with the exception of the west side of Pedro Miguel locks which was out of operation for the inspection of the emergency gate during the period April 18 to April 26. The next of the major overhauls is scheduled for the Gatun Locks starting in January 1947.

A preliminary study of the modernization of the locks, electrical system was made during the year.

POWER FOR CANAL OPERATION

The table below summarizes and gives pertinent data relative to the electric power generated by the power system of the Canal Zone for the past 3 fiscal years:

	Fiscal year		
	1946	1945	1944
Gross power generated:			
Gatun hydro station.....	87,516,900	91,683,100	89,314,900
Madden hydro station.....	159,120,700	165,419,800	157,459,700
Diesel stations.....	13,500,500	12,776,700	604,000
Total generated.....	260,138,100	269,879,600	247,378,600
Consumed in station service.....	2,645,088	3,106,023	1,360,617
Net generator output.....	257,493,012	266,773,577	246,017,983
Distributed to consumers.....	226,810,535	236,318,174	222,548,235
Transmission loss—(kilowatt-hours).....	30,682,477	30,455,403	23,469,748
Transmission loss—(percent).....	11.92	11.41	9.5
Peak load (kilowatts).....	50,400	47,300	46,900
Date.....	(1)	(2)	(3)

¹ Oct. 3, 1945.

² Feb. 9, 1945.

³ Nov. 1, 1943.

Work was continued on the installation of the new No. 5 generating unit in the Gatun hydroelectric station, and at the end of the fiscal year 1946 was 75 percent complete. The expansion of the existing plant at the Gatun hydroelectric station to include generating units Nos. 5 and 6 was planned in 1942, but actual work on the project was suspended until 1945. The installation of both new units is scheduled for completion early in the fiscal year 1947. The material for modernizing ten 6,600-volt feeder circuit breakers was received and work was completed on the modernization of four feeders.

Two new turbine runners, together with miscellaneous parts to complete overhaul of Nos. 1 and 2 turbines for the Madden hydroelectric

station, have been received and stored in the station. In order to maintain the required power output, the overhaul of these two turbines is being delayed pending the placing in service of the new generating unit at the Gatun hydroelectric station.

The assembly of No. 3 engine at the Miraflores Diesel-electric station was completed during the fiscal year 1946.

During the past year service was temporarily interrupted at various substations on five different occasions. There were 24 interruptions to transmission line service during the year, of which 3 were caused by lightning flash-over, 1 by mechanical failure of insulator, 1 by bird contact (nest), 1 by insulator flash-over, 1 by animal contact, and 17 by unknown causes.

WATER SUPPLY AND GENERAL WEATHER CONDITIONS

WATER SUPPLY

The water requirements of The Panama Canal for hydroelectric power, lockages, and municipal use are supplied by Madden and Gatun Lakes which together drain an area of 1,289 square miles. All outflow from Madden Lake, whether spilled at Madden Dam or drawn for use of Madden hydroelectric station, flows into Gatun Lake and together with the direct inflow from the area downstream from Madden Dam remains available for Gatun Lake uses. The total flow into Madden and Gatun Lakes during the year ended June 30, 1946, amounted to 193,599 million cubic feet, which is 8 percent below the average inflow for the 32 years since the formation of Gatun Lake. Evaporation losses from Madden and Gatun Lakes totaled 23,519 million cubic feet, leaving 170,080 million cubic feet available for use. The source and expenditure of this water, together with comparable data for the preceding year, are itemized in the following tabulation:

	Million cubic feet year ended June 30—		Percent of available water supply year ended June 30—	
	1946	1945	1946	1945
MADDEN AND GATUN LAKE WATER SUPPLY				
Direct flow into Madden Lake.....	81,751	102,968		
Evaporation from Madden Lake.....	2,432	2,454		
Available for Madden Lake uses.....	79,319	100,514		
Direct flow into Gatun Lake.....	111,848	127,194		
Subtotal.....	191,167	227,708		
Evaporation from Gatun Lake.....	21,087	20,312		
Available for Gatun Lake uses.....	170,080	207,396		
MADDEN LAKE WATER EXPENDITURES				
Madden hydroelectric power.....	65,968	64,860	83.2	64.5
Madden spillway discharge.....	12,832	43,264	16.2	43.0
Change in Madden Lake storage.....	+519	-7,610	+ .6	-7.5
Total Madden Lake expenditures.....	79,319	100,514	100.0	100.0
GATUN LAKE WATER EXPENDITURES				
Gatun hydroelectric power.....	62,340	65,093	36.6	31.4
Gatun and Pedro Miguel lockages.....	52,000	42,949	30.6	20.7
Municipal and other uses.....	3,249	3,158	1.9	1.5
Subtotal Gatun Lake uses.....	117,589	111,200	69.1	53.6
Gatun spillway discharge.....	54,589	114,656	32.1	55.3
Change in Madden and Gatun Lake storage.....	-2,098	-18,460	-1.2	-8.9
Total Gatun Lake expenditures.....	170,080	207,396	100.0	100.0

STORMS AND FLOODS

No storms occurred during the year with wind velocities high enough to cause any material damage to Canal structures. The only noteworthy general storm was the heavy rainstorm of December 4-6, 1945, which did not last long enough to produce any serious flood problem. This storm was of the "norther" type and was general over the entire Canal Zone region, but the heavy rains were confined to a comparatively small area near the Atlantic coast. Four-day rainfall totals, December 3-6, inclusive, ranged from maximum amounts of 17.15 inches at Agua Clara and 15.46 inches at Gatun on the Atlantic slope, to minimum amounts of 3.39 inches at Balboa on the Pacific coast and 3.73 inches at Salamanca in the Madden Lake area. The 4-day inflow into Madden and Gatun Lakes, December 4-7, inclusive, amounted to 18½ billion cubic feet, compared with 4-day inflows of 19 billion cubic feet in the storm of December 1944 and 42 billion cubic feet in the storm of October 1923, the largest flood since the formation of Gatun Lake. It was necessary to operate 10 gates at the Gatun spillway on 3 successive days, December 4, 5, and 6, with a maximum discharge of 110,437 cubic feet per second. The four drum gates at Madden Dam were lowered to elevation 248 feet for a 24-hour period with a maximum discharge in the Changres River channel at Alhajuela, a short distance downstream from Madden Dam, of 30,500 cubic feet per second.

DRY SEASON—1946

The 1946 dry season was approximately normal in duration but was considerably drier than usual, the total flow into Madden and Gatun Lakes for the 4-month period, January to April, inclusive, being 31 percent below the 33-year average for the same period. The period during which the flow into Madden and Gatun Lakes was insufficient to provide water for evaporation losses from lake surfaces and for Panama Canal uses extended from January 2 to May 13, inclusive, a duration of 132 days. The total flow into Madden and Gatun Lakes during this 132-day period was 13,906 million cubic feet and the total water expenditures was 48,063 million cubic feet, consisting of 10,705 million cubic feet lost by evaporation from lake surfaces and 37,358 million cubic feet withdrawn for Panama Canal use. The dry-season draft on lake storage amounted to 34,157 million cubic feet, of which 14,366 million cubic feet were drawn from Madden Lake and 19,791 million cubic feet from Gatun Lake. The total draft on storage during the 1946 dry season was the greatest on record since the beginning of Canal operation. This was due not only to less run-off than usual but also to increased water use.

LAKE ELEVATIONS

During the fiscal year ended June 30, 1946, Madden Lake varied in elevation between a maximum of 255.01 feet on December 6, 1945, and a minimum of 217.70 feet on May 15, 1946, a total range of 37.31 feet. Gatun Lake varied in elevation between a maximum of 87.13 feet on December 20, 1945, and a minimum of 82.50 feet on June 27, 1946, a total range of 4.63 feet. Minimum elevations for both lakes were the lowest recorded in recent years.

RAINFALL

During the fiscal year ended June 30, 1946, rainfall was near or slightly above normal along the Atlantic coast and over the Madden Lake area and somewhat below normal along the Pacific slope and over the interior valleys in the vicinity of Gatun Lake. Along the line of the Canal channel, annual totals ranged from a minimum of 61.59 inches at Balboa Heights near the Pacific terminal to a maximum of 137.46 inches at Gatun near the Atlantic terminal. February was the month of least rainfall with monthly totals in the Canal Zone area ranging from a trace to 2.16 inches. November was the month of greatest rainfall with monthly totals ranging from 7.08 inches to 32.36 inches. The greatest amount of rainfall in 24 consecutive hours was 8.67 inches at Agua Clara on December 4-5.

AIR TEMPERATURES

Air temperatures in the Canal Zone during the fiscal year ended June 30, 1946, averaged a fraction of a degree above normal. There was little variation in temperature throughout the year, no monthly mean at any station departing more than 2.4° from the annual mean. Annual means and extremes at Canal Zone stations for the fiscal year ended June 30, 1946, are given in the following table:

Station	1946 maximum		1946 minimum		1946 mean, ° F.	Departure, ° F.
	° F.	Date	° F.	Date		
Balboa Heights.....	97	Apr. 28, 1946	69	Féb. 25, 1946	79.3	+0.5
Madden Dam.....	96	May 4, 1946	64	do.....	77.7	+0.2
Cristobal.....	94	Oct. 2, 1945	70	June 9, 1946	80.2	+0.1

Annual extremes and means on record at the above stations are as follows:

Station	Absolute maximum		Absolute minimum		Annual mean ° F.
	° F.	Date	° F.	Date	
Balboa Heights.....	97	Apr. 28, 1946	63	Jan. 27, 1910	78.8
Madden Dam.....	98	Apr. 13, 1920	59	Feb. 4, 1924 Jan. 30, 1929	77.5
Cristobal.....	95	Oct. 18, 1924 May 21, 1925	66	Dec. 3, 1909	80.1

WINDS AND HUMIDITY

Wind velocities for the fiscal year ended June 30, 1946, averaged 7 miles per hour at Balboa Heights on the Pacific coast and 10 miles per hour at Cristobal on the Atlantic coast. Monthly mean velocities at Balboa Heights ranged from 5 miles per hour in August to 11 miles per hour in March. Monthly mean velocities at Cristobal ranged from 6 miles per hour in September to 16 miles per hour in February. The most frequent directions were northwest along the Pacific coast and northeast along the Atlantic coast. Maximum velocities for

5-minute periods were 29 miles per hour from the south at Balboa Heights on October 10, 1945, and 30 miles per hour from the north at Cristobal on December 5, 1945.

The relative humidity averaged 82 percent at Balboa Heights and 81 percent at Cristobal. At Balboa Heights monthly means ranged from 72 percent in March to 88 percent in August, and at Cristobal monthly means ranged from 75 percent in February to 86 percent in June.

TIDES

During the fiscal year ended June 30, 1946, absolute tidal ranges at Canal terminals were 21.5 feet on the Pacific coast and 2.46 feet on the Atlantic coast. At Balboa, the Pacific terminal of the Canal, the following extremes occurred: Highest high water 10.3 feet above mean sea level, lowest low water 11.2 feet below mean sea level, with the greatest range between consecutive tides 21.3 feet on October 23, 1945. At Cristobal, the Atlantic terminal of the Canal, the following extremes occurred: Highest high water 1.38 feet above mean sea level, lowest low water 1.08 feet below mean sea level, with the greatest range between consecutive tides 1.88 feet on November 22, 1945, and December 19, 1945.

SEISMOLOGY

Four earthquakes were felt by Canal Zone residents during the fiscal year ended June 30, 1946. None exceeded intensity IV on the Modified Mercalli Scale and none caused any damage in the Canal Zone area. The most intense shock of the year was recorded at Balboa Heights on July 5, 1945 at 7:03 a. m., seventy-fifth meridian time. It was rated locally at Intensity IV. Later reports indicated that the epicenter was located near Santa Fe, Province of Feraguas, Republic of Panama, about 100 miles in a westerly direction from Balboa Heights. The other three shocks were light and were felt by only a few residents of the Canal Zone. They were rated at intensities I to II and all occurred within a distance of 50 miles from Balboa Heights.

MARINE ACTIVITIES

Marine activities were at a high level in the early months of the fiscal year 1946 by reason of heavy Canal traffic, discussed earlier in this report under "Statistics on Canal Traffic." The preponderance of Pacific-bound traffic which prevailed throughout the fiscal year 1945 continued until October 1945; following the cessation of hostilities the return of large numbers of vessels from the Pacific reversed the trend, however, and from October 1945 to the end of the fiscal year 1946 the majority of traffic was Atlantic-bound. On October 22 and 23, transits were restricted to Atlantic-bound ships only, in order to relieve the congestion which had occurred in Balboa. On these 2 days 68 ships were passed through—35 on October 22 and 33 on October 23.

Twenty-seven new FM two-way radio telephone sets were received during the year as replacement for old AM installations in floating equipment. When the complete change-over to FM equipment has been effected, all harbor craft and activities of the marine division will be connected by two-way radio telephone operating on a single frequency of 34,740 kilocycles.

HARBOR ACTIVITIES

The table following shows the number of vessels handled at docks of the terminal ports of Cristobal and Balboa for the fiscal year 1946 as compared with the 2 previous years:

	Cristobal—Fiscal year			Balboa—Fiscal year		
	1946	1945	1944	1946	1945	1944
Number of vessels docked:						
Handling passengers and/or cargo.....	1, 149	1, 221	817	513	801	697
For all other purposes.....	3, 172	2, 814	1, 333	2, 058	2, 183	1, 410
Total.....	4, 321	4, 035	2, 150	2, 571	2, 984	2, 107

On July 9, 1945, floating drydock *YFD No. 6*, stationed at Balboa, was used for the first time. The steamship *Apache Canyon*, a C-2 type cargo vessel, 526 feet 6 inches in length and of 10,173 gross tons, was docked without incident.

AIDS TO NAVIGATION

On June 30, 1946, there were 746 aids to navigation in service in the Panama Canal and its approaches, maintained by the aids to navigation subdivision and classified as follows: Acetylene gas-operated, 108; electrically operated, 334; unlighted, 304. Included in the foregoing are two automatic acetylene gas-operated lighthouses, located at Morro Puercos and at Jicarita Island on the coast of Panama in the Pacific approach. Two visits were made to these lighthouses during the year by the U. S. S. *Favorite* for the purpose of inspecting and servicing the equipment.

ACCIDENTS TO SHIPPING

The board of local inspectors investigated and reported on 34 accidents in connection with shipping in Canal Zone waters during the fiscal year 1946, a summary of which follows together with a comparison of accidents in the 2 previous years:

Cause of accident	Fiscal year		
	1946	1945	1944
Collision.....	11	13	12
Ship struck lock wall.....	7	13	6
Ship struck dock.....	4	6	6
Ship grounded.....	3	-----	4
Ship damaged by tug.....	-----	2	3
Ship struck Canal bank.....	2	3	2
Other causes.....	7	13	4
Total.....	34	50	37

An accident caused by the ignition of gasoline on water was responsible for the only fatality during the year.

INSPECTIONS

Complete inspections were made of the hulls, power plant, and equipment of 13 American and 16 foreign vessels and certificates of seaworthiness issued. Sixty-seven hulls of commercial, Panama Canal and Panama Railroad vessels were inspected in drydock. Sixty steam boilers were given annual inspections and hydrostatic tests. Seventy-five air tanks and 33 CO₂ fire-extinguishing systems were inspected. Annual inspections were made and pertinent certificates issued to 181 motorboats.

ADMEASUREMENT

The admeasurement activities during the year were characterized by a heavy work load attributable to the arrival of many newly constructed vessels, and the remeasurement of many vessels necessitated by their reconversion from war- to peace-time purposes.

SALVAGE AND TOWING

On July 23, 1945, the tug *Tavernilla* was dispatched to sea to rescue a small Panamanian craft, the *Ricardo Arias*, the main engines of which had become disabled. The *Ricardo Arias* was brought to port successfully.

The tug *Gorgona* was sent from Balboa on December 7, 1945, to assist the *Viking Lass*, a small Honduran vessel, which had grounded on Rey Island of Las Perlas group. With the aid of a Navy tug, this ship was assisted off the island and brought to Balboa, arriving December 8.

From January 30 to February 4, 1946, the *Favorite* was engaged in towing to Balboa the steamship *Marmex*, a Mexican freighter which experienced engine trouble at sea.

On September 3, 1945, the Navy floating dry dock *YFD No. 3* started transit of the Canal southbound to Balboa. Since the beam of the drydock exceeded the width of the locks, it was necessary to careen the dock on its side in accordance with the procedure which had been previously developed for transit of a similar dock on June 1, 1945. The entire transit was made with the dock in that position and was completed according to schedule on September 4, without damage to the drydock section or to the locks.

OPERATION OF TUGS

In December 1945, Balboa ceased to be the home port for a fleet of oil tankers employed in carrying cargoes to the Pacific war theater. With the consequent reduction in harbor movements, four Panama Canal tugs which had temporarily been assigned to assist in the handling of harbor traffic were returned to the dredging service, leaving only two tugs on duty at Balboa after May 1, 1946.

The following statistics summarize the services of tugs used in marine activities (as distinct from dredging) during the past 3 fiscal years:

	Operating hours—Fiscal year			Jobs handled—Fiscal year		
	1946	1945	1944	1946	1945	1944
Balboa	15,649	19,819	9,780	6,720	8,791	6,408
Cristobal	10,665	12,816	5,964	3,836	9,325	4,392
Total	26,314	32,635	15,744	10,556	18,116	10,800

The table above does not include statistics for tugs which were occasionally borrowed from dredging service to assist vessels during emergencies. It does include dredging service tugs rented over periods of time and operated under orders of the marine division.

MAINTENANCE OF CHANNEL—OTHER DREDGING ACTIVITIES

Dredges were operated throughout the year on the maintenance of the Canal channel, terminal harbors, and on various special projects, including a substantial amount of excavation on the third locks project. In 1946 total material excavated amounted to 13,951,800 cubic yards, which was 25 percent less than the amount removed in the previous fiscal year.

Excavation during the year is summarized in the following table:

Location	Earth	Rock	Total
CANAL PRISM DREDGING			
	<i>Cubic yards</i>	<i>Cubic yards</i>	<i>Cubic yards</i>
Atlantic entrance, maintenance	2,079,000	274,500	2,353,500
Gaillard Cut, maintenance, including slides	257,200	191,800	449,000
Gaillard Cut, project No. 13	107,600	397,200	504,800
Pacific entrance:			
Maintenance	4,474,600		4,474,600
Project No. 1-C	155,900		155,900
Total, Canal prism	7,074,300	863,500	7,937,800
AUXILIARY DREDGING			
Cristobal Harbor:			
Outer harbor, west anchorage	2,656,700	62,000	2,718,700
Harbor approach channel	1,176,000	53,000	1,229,000
Colon fill	40,000	79,800	119,800
Refloating S. S. <i>Laurence J. Gallagher</i>	1,300	10,000	11,300
Total auxiliary	3,874,000	204,800	4,078,800
THIRD LOCKS DREDGING			
New approach channels:			
New Miraflores locks:			
North approach	14,400	36,400	50,800
South approach	1,142,400	742,000	1,884,400
Total approach channels	1,156,800	778,400	1,935,200
Grand total:			
Fiscal year 1946	12,105,100	1,846,700	¹ 13,951,800
Fiscal year 1945	14,816,700	3,752,900	¹ 18,569,600

¹ In addition 36,755 cubic yards of Chame sand were produced in fiscal year 1946 and 25,615 cubic yards in 1945.

Dredging operations are divided into three major districts; the Atlantic district extending from contour 42 feet below mean sea level in the Atlantic Ocean to Gatun locks; the central district, extending from Gatun Locks to Pedro Miguel locks; and the Pacific district, ex-

tending from Pedro Miguel locks to contour 50 feet below mean sea level in the Pacific Ocean. The total excavation in these three areas, exclusive of third locks excavation, is summarized as follows:

[Cubic yards]

	District			Total
	Atlantic	Central	Pacific	
Canal prism:				
Earth.....	2,079,000	364,800	4,630,500	7,074,300
Rock.....	274,500	589,000	0	863,500
Total.....	2,353,500	953,800	4,630,500	7,937,800
Auxiliary:				
Earth.....	3,872,700	1,300	0	3,874,000
Rock.....	194,800	10,000	0	204,800
Total.....	4,067,500	11,300	0	4,078,800
Total (exclusive of third locks):				
Earth.....	5,951,700	366,100	4,630,500	10,948,300
Rock.....	469,300	599,000	0	1,068,300
Grand totals:				
Fiscal year 1946.....	6,421,000	965,100	4,630,500	¹ 12,016,600
Fiscal year 1945.....	8,499,700	936,500	6,861,800	¹ 16,298,000

¹ Does not include Chagres River gravel or Chame sand service.

ORDINARY CHANNEL MAINTENANCE—CANAL PRISM DREDGING

ATLANTIC DISTRICT

Atlantic entrance.—In the Atlantic district, maintenance dredging of the Canal channel by pipe-line suction dredges was in progress 101 days during the year. The total maintenance dredging on this section of the Canal channel for the year amounted to 2,353,500 cubic yards, details of which follow:

Equipment	Days worked	Yardage dredged		
		Earth	Rock	Total
<i>Las Cruces</i>	18	313,300	¹ 30,000	343,300
<i>Mindi</i>	83	1,765,700	¹ 244,500	2,010,200
Total.....	101	2,079,000	¹ 274,500	2,353,500

¹ Unmined rock and gravel.

CENTRAL DISTRICT

Gaillard Cut.—In maintenance dredging by dipper dredges 299,100 cubic yards were removed from Gaillard Cut (excluding 149,900 cubic yards of slide material). Further details of this dredging are given below:

Equipment	Days worked	Yardage dredged		
		Earth	Rock	Total
<i>Cascadas</i>	38½	97,300	¹ 47,800	145,100
<i>Paraiso</i>	43¾	125,400	¹ 28,600	154,000
Total.....	82	222,700	¹ 76,400	299,100

¹ Unmined rock.

Project No. 13.—This project, which consists of widening Culebra Reach by 200 feet to the westward, was started in January 1935 and has been continued on a low priority basis since that time. A total of 402,400 cubic yards of rock was broken by shore mining, and 450,400 cubic yards of material, comprising 297,900 cubic yards of mined rock, 8,000 cubic yards of unmined rock and 144,500 cubic yards of earth, were sluiced into the Canal prism to be removed by regular dredging operations. During 1946 dipper dredges excavated a total of 504,800 cubic yards from this project, as follows:

Equipment	Days worked	Yardage dredged		
		Earth	Rock	Total
<i>Cascadas</i>	41	35,000	¹ 220,600	255,600
<i>Paraiso</i>	49½	72,600	² 176,600	249,200
Total.....	90½	107,600	397,200	504,800

¹ 183,100 cubic yards mined; 37,500 cubic yards unmined.

² 151,700 cubic yards mined; 24,900 cubic yards unmined.

The balance of 149,900 cubic yards dredged from the Canal prism in the central district was slide material, further details of which will be found under "Slides".

PACIFIC DISTRICT

Pacific entrance, maintenance.—A total of 4,474,600 cubic yards of earth was removed in maintaining the Pacific entrance section of the Canal channel. This dredging was performed by the pipe-line suction dredge *Las Cruces*, which was employed 180 days on the work.

Pacific entrance, project No. 1-C.—A total of 155,900 cubic yards of earth was dredged on this project during 1946. This dredging was performed by the pipe-line dredge *Las Cruces* which was employed 18 days on the work. A description of this project, authorized August 26, 1942, appears on page 42 of the Governor's annual report for 1943.

AUXILIARY DREDGING—OTHER PROJECTS

ATLANTIC DISTRICT

Cristobal approach channel.—The pipe-line suction dredge *Mindi* worked 59½ days during 1946 on the Cristobal approach channel, excavating 1,229,000 cubic yards of material, which included 53,000 cubic yards of unmined coral rock and 1,176,000 cubic yards of earth.

Cristobal outer harbor.—The pipe-line suction dredge *Mindi* was employed 83 days during 1946 on the Cristobal outer harbor, excavating 2,718,700 cubic yards of material of which 62,000 cubic yards were unmined coral rock, and 2,656,700 cubic yards were earth.

Colon fill.—The pipe-line suction dredge *Mindi* worked 18 days during 1946 in Manzanillo Bay, dredging material required to make a fill on the undeveloped portion of Manzanillo Island for the Republic of Panama. This fill, to be used in connection with the extension of the Colon townsite, will be completed in the next fiscal year. The dredge excavated 119,800 cubic yards of material, including 79,800 cubic yards of coral rock and 40,000 cubic yards of sand.

CENTRAL DISTRICT

Refloating vessel.—The dipper dredge *Paraiso* worked $1\frac{1}{2}$ days in refloating the steamship *Laurence J. Gallagher* which had run aground in Gatun Lake. The dredge removed 11,300 cubic yards of material, of which 10,000 cubic yards were unmined rock and 1,300 cubic yards were earth.

THIRD LOCKS DREDGING

The Panama Canal's dredging division is charged with the performance of practically all of the wet excavation in connection with the third locks project.

During the past year the following construction dredging was performed in various approach channels for this project:

New Miraflores locks north approach channel.—Subaqueous mining was in progress for 204 days in this area, during which time 44,500 cubic yards of rock were broken. The pipe-line suction dredge *Mindi* worked $17\frac{1}{2}$ days, removing 50,800 cubic yards of material, of which 32,100 cubic yards were mined rock, 4,300 cubic yards unmined rock, and 14,400 cubic yards earth. Total construction excavation to the end of the fiscal year aggregated 2,885,100 cubic yards, at which time the project was 70.7 percent complete.

New Miraflores locks south approach channel.—Subaqueous mining was in progress 342 days, during which 320,100 cubic yards of rock were broken. Dredging in this channel was in progress 311 days, during which time a total of 1,884,400 cubic yards of material were removed, comprising 742,000 cubic yards of rock and 1,142,400 cubic yards of earth. Further details of this dredging are given in the following tabulation:

Equipment	Days worked	Yardage dredged		
		Earth	Rock	Total
<i>Cascadas</i>	164½	223, 100	¹ 402, 300	625, 400
<i>Paraiso</i>	78	48, 300	² 185, 300	233, 600
<i>Las Cruces</i>	68¾	871, 000	³ 154, 400	1, 025, 400
Total.....	311¾	1, 142, 400	742, 000	1, 884, 400

¹ 355,500 cubic yards mined; 46,800 cubic yards unmined.

² All mined rock.

³ 97,200 cubic yards mined; 57,200 cubic yards unmined.

The total excavation to date from the New Miraflores locks south approach channel is 9,153,600 cubic yards. The project was 87.7 percent completed at the end of the year.

Isthmian Canal studies (Public Law No. 280).—Core samples were taken along various proposed routes including the present Canal alignment—Gatun to Pedro Miguel Locks. A total of 46 holes, with a combined depth of 10,823 feet, was drilled.

SLIDES

Excavation from slides in Gaillard Cut from June 30, 1913, to June 30, 1945, totaled 51,844,000 cubic yards. During the past year 149,900 cubic yards of slide material were excavated, bringing the total excavation from slides to 51,993,900 cubic yards as of June 30, 1946. Slide

activity throughout the Cut was generally much less than in previous years. Culebra slide (west) continued to be the most active of the slides. Small movements were observed in four slide areas during the year. Only at barge repair slide (east) and at a large bank break between stations 1600-1602 (west), involving approximately 22,000 cubic yards, did any slide material enter the Canal prism. Numerous other bank breaks occurred, all of which were limited to small movements of no consequence. There was no interference with shipping on account of slides during the year.

The dredge *Cascadas* worked 8 days in the barge repair slide (east), removing 39,200 cubic yards of material, which included 32,700 cubic yards of unmined rock and 6,500 cubic yards of earth.

The dredge *Paraiso* worked 35 days in Culebra slide (west), removing 110,700 cubic yards of material, which included 70,200 cubic yards of mined rock, 12,500 cubic yards of unmined rock, and 28,000 cubic yards of earth. Shore mining in this slide was in progress for 145 days and 5,400 cubic yards of rock were broken.

SUBSIDIARY DREDGING DIVISION ACTIVITIES

SAND AND GRAVEL

During the past fiscal year 62,123 cubic yards of sand and gravel of all classes (both run-of-bank and washed) were shipped from the gravel stock pile at Gamboa, as compared with 104,344 cubic yards shipped in the previous fiscal year. No run-of-bank gravel was pumped into the stock pile at Gamboa.

The craneboat *Atlas* was in service for 28¼ days excavating 36,755 cubic yards of sand at Chame Point, Republic of Panama. This sand was pumped into barges and delivered at dock 7, Balboa, for the supply department.

HYACINTH CONTROL AND OTHER ACTIVITIES

The Canal and adjacent waters through Gaillard Cut, Miraflores Lake, and Gatun Lake (including all dump areas) were periodically patrolled throughout the year for the purpose of keeping the growth of hyacinths under control. Log booms at the mouths of the Chagres and Mandinga Rivers were maintained to prevent hyacinths, logs, floating islands, and other obstructions from entering the Canal channel during freshets or spilling at Madden Dam. During the year, periodical inspection trips were made in the Chagres, Mandinga, Frijoles, and Azules Rivers and along the shores of Barro Colorado Island, Pena Blanca, and Gigante Bays, dumps Nos. 1 to 14, and Miraflores, Pedro Miguel, and Red Tank Lakes. Weekly inspection trips were also made of the Canal channel between Gamboa and Gatun.

It is estimated that 35,071,000 hyacinth plants were destroyed during the past year, of which 11,240,000 were pulled and 23,831,000 were sprayed; of the plants pulled 2,250,000 were removed by the debris cableway. Forty-four cords of driftwood were removed by the debris cableway during the past year, and an additional estimated 299 cords of driftwood were picked up along the banks of the Chagres, Mandinga, and Cocoli Rivers, Gaillard Cut, and Gatun, Miraflores, Pedro Miguel, and Red Tank Lakes.

EQUIPMENT

The more important items of dredging equipment or plant were operated during the past year as shown in the following tabulation:

Unit and name	Type	In service	Out of service	
			Repairs	Reserve or stand-by
		<i>Months</i>	<i>Months</i>	<i>Months</i>
Dredges:				
Cascadas	15-yard dipper	8.3	3.7	
Gamboa	do			12.0
Paraiso	do	6.8	.6	4.6
Las Cruces	24-inch suction	9.4	2.6	
Mindi	28-inch suction	8.6	3.4	
Craneboat: Atlas	75-ton	8.7		3.3
Derrick barge: No. 157	40-ton	2.8	.3	8.9
Grader barge: No. 4	14-inch pumps	11.8		.2
Relay barges:				
No. 3		4.2		7.8
No. 24				12.0
Drillboats:				
Terrior No. 2	Steam			12.0
Teredo No. 2	do			12.0
Vulcan	Air	1.1		10.9
Thor	do	11.2	.8	
Air compressor: No. 29	2,500 cubic feet per minute	12.0		
Floating cranes:				
Ajaz	250-ton	1.6		10.4
Hercules	do	3.5		8.5
Ferry boats:				
Presidente Amador		6.9	.5	4.6
Presidente Roosevelt		8.3	.7	3.0
Presidente Porras		8.6	.1	3.3

In addition to the above, large and small tugs and an attendant fleet of dump scows, sand barges, and service lighters, launches, quarterboats and related drilling and excavating equipment were also operated as part of the dredging plant. At the end of the year four large and three small tugs were engaged in or available for dredging service.

FERRY SERVICE

Thatcher Ferry service was continuous throughout the past year except for 32 days—from September 17 to October 17 when service was suspended because of repairs to the ferry rackings, and on June 19 and June 20 on account of repairs to the ramps. This ferry crosses the Canal at the Pacific terminal and connects Balboa on the east bank with Thatcher highway on the west bank. Service was maintained by rotating the three ferryboats, *Presidente Amador*, *Presidente Roosevelt* and *Presidente Porras*, keeping two of these ferries in continuous service.

Since the opening of the new bridge across the Canal at Miraflores in May 1942, the ferry traffic has become fairly well stabilized. In the following table are shown the more important statistics relative to operations of the Thatcher Ferry for the past 3 fiscal years:

	Fiscal year		
	1946	1945	1944
Single trips made.....	51, 263	55, 928	54, 639
Vehicles carried:			
Panama Canal vehicles.....	15, 347	29, 472	32, 681
United States military vehicles.....	101, 628	138, 916	163, 723
Commercial trucks.....	93, 764	79, 042	91, 148
Commercial passenger cars.....	92, 766	91, 964	92, 723
Private cars.....	202, 474	188, 982	216, 991
Total vehicles carried.....	505, 979	528, 376	597, 266
Total passengers carried.....	2, 401, 329	2, 785, 612	3, 211, 690

THIRD LOCKS PROJECT

The third locks project, providing for the improvement and enlargement of the capacity of the Panama Canal in the interest of defense and interoceanic commerce at a cost not to exceed \$277,000,000, was authorized by act of Congress, Public Law No. 391, Seventy-sixth Congress, first session, approved August 11, 1939. The project involves the design and construction of a new set of locks at some distance from the existing locks, the excavation of approach channels to connect the new locks with the existing Canal, and the design and construction of appurtenant works.

Excavation work on the third locks project was started by the dredging plant of The Panama Canal on July 1, 1940. The entire program was prosecuted vigorously from that date until May 1942. On May 25, 1942, the Governor, pursuant to a directive of the Secretary of War, issued instructions drastically curtailing the scope of the work to be undertaken on the third locks project, in view of the urgent need for manpower and materials in the over-all war program.

Under the modified program, dredging in the approach channels was continued but on a lower priority basis. The contract for excavation of the new Gatun locks was carried to completion, but the similar contract on the Pacific side was terminated with partial completion of the excavations for the new Miraflores and new Pedro Miguel locks. Other features carried to completion were the designs and specifications, construction of the bridge over existing Miraflores locks, the relocation of various utilities, and the construction of emergency electric power plants. Among the important items suspended under the modified program were the contracts for construction of the locks structures, furnishing cement, processing aggregates, and the fabrication of miter gates and bulkheads.

All phases of the scheduled design, including studies, drawings, and specifications for the third locks project, were completed during 1946 and the final reports were practically complete except for minor revisions. Progress was made on the long-term test to determine the corrosion behavior of the principal metals and alloys in tropical atmosphere, and in fresh and salt waters of the tropics.

During 1946 1,935,200 cubic yards were excavated from the approaches to the new Miraflores locks; further details of the dredging work on the third locks project are given on page 40 of this report.

The dredging program was scheduled for completion during the fiscal year 1947 but as a result of studies authorized by Public Law No. 280, Seventy-ninth Congress, it is anticipated that the dredging will be suspended pending completion of the studies and further action by Congress on the recommended project.

INVESTIGATION OF MEANS OF INCREASING THE CAPACITY AND SECURITY OF THE PANAMA CANAL

An investigation of means for increasing the capacity and security of the Panama Canal to meet the future needs of interoceanic commerce and national security, including a restudy of the third locks project, was authorized by Public Law No. 280, Seventy-ninth Congress, first session, approved December 28, 1945. This act also authorized the making of such studies as may be deemed necessary to determine whether a canal or canals at other locations, or any new means of transporting ships across land, may be more useful than the present Canal with improvements for the purposes stated. A report on these studies is to be made to the Congress, through the Secretary of War and the President, not later than December 31, 1947.

In the latter part of January 1946 an outline of the scope of the new studies was completed and key personnel were tentatively selected. Full-scale recruiting was started in April and by the end of the fiscal year the major portion of the new organization had arrived on the Isthmus. A board of six consulting engineers was appointed by the Governor to advise him on various engineering aspects of the studies.

Work on the initial phases of the studies has progressed satisfactorily. Geological core borings were started in March and by June 30 46 holes with an aggregate footage of 10,823 had been completed in the Gatun Lake and Gaillard Cut regions of the Panama Canal. Reconnaissance field mapping along selected alternative routes in Panama was started, and preliminary estimates of dredging quantities involved, for comparison of various sea-level alignments in Panama, were completed. Other work in progress at the end of the year included the assembly and evaluation of all information on alternative routes, and the construction of a hydraulic model of a sea-level Canal based on the existing Panama Canal alignment.

On March 19 and 20, 1946, a conference on dredging was held in Philadelphia, at which representatives of 30 dredging companies, the Corps of Engineers, and The Panama Canal were present. The purpose of this conference was to discuss the single-stage and multiple-stage lowering plans for converting the present lock canal to a sea-level canal, and the practicability of constructing and operating dredging equipment of unprecedented size and power. Subsequent to this meeting negotiations were initiated with a view to entering into development design contracts for special dredges.

SECTION II

BUSINESS OPERATIONS

The business enterprises operated by The Panama Canal and by the Panama Railroad Company embrace a number of activities which in the United States would normally be carried on by private enterprise. These activities have been developed to meet the needs of shipping passing through the Canal and of the Canal-Railroad, Army and Navy organizations, and their employees. During the war years these activities were expanded and adjusted to meet the requirements of the war effort and served very important needs of the Army and Navy. The business enterprises include the supply of fuel, provisions, ship chandlery, and repairs to vessels; the provision of public utility services; the maintenance of living quarters, and the sale of food, clothing and other essentials to Canal and Railroad employees; the handling of cargo and allied operations; and the operation and management of a railroad line. A steamship line between New York and the Isthmus also was operated prior to the outbreak of war but the steamers of the line were requisitioned early in the emergency for direct employment in the war effort; it is expected that during the fiscal year 1947 the three vessels of the line will be returned to normal operations of the Company.

The Canal and the Railroad are separate organizations, but the administration of both organizations is vested in the Governor of The Panama Canal, who is also president of the Panama Railroad Company.

PANAMA CANAL BUSINESS OPERATIONS

Business operations of the Panama Canal are conducted separately from operating activities pertaining directly to the transiting of vessels and the government and sanitation of the Canal Zone. The annual appropriation acts for The Panama Canal authorize the expenditure and reinvestment of all moneys received from the conduct of auxiliary business activities, with the proviso that any net profit derived from such business activities shall be covered annually into the Treasury of the United States.

It is the aim to operate the business activities as a whole on a self-supporting basis and, in general, to include as a charge against their operations a fixed capital charge of 3 percent as interest on the net investment. The amount representing charges for interest on investment is a part of the net profits covered into the Treasury and is in effect a reimbursement to the United States. The net investment in business activities totaled \$34,161,338.58 on July 1, 1945 and the capital charge for the fiscal year 1946 was \$1,031,554.16 (table No. 20, sec. V). The net revenue of \$876,835.29 fell short of this capital charge by \$154,718.87.

MECHANICAL AND MARINE WORK

On the basis of revenues received for work accomplished there was an over-all decrease of 32 percent in the volume of business performed by the mechanical division in comparison with the fiscal year 1945. The first quarter of 1946 saw the activities of the division continuing at the high level prevailing in 1945, but after the cessation of hostilities in the Pacific there was a sharp curtailment of the work load. Revenues from the United States Navy which totaled more than \$5,000,000 and formed the chief source of income in 1945 (31.3 percent), dropped to under \$2,000,000 in 1946 and comprised only 18.2 percent of the total revenues. A substantial decline also was recorded in the volume of work performed for "other Government departments," which consisted primarily of repairs to a fleet of special tankers in the Pacific tanker pool which were based at the Pacific terminal of the Canal for about a year prior to the cessation of hostilities in the Pacific. These tankers were withdrawn from the Pacific terminal shortly after the war ended. Work for the United States Army and commercial interests also declined in 1946, while that for The Panama Canal and Panama Railroad Company was at substantially the same level as in the previous year.

Normally work done for the divisions of The Panama Canal organization accounts for approximately 50 percent of the mechanical division work load. The past 5 years has seen this decline to the low of 16.4 percent of the total in 1945; in the fiscal year 1941 over 58 percent of the work load was for Panama Canal divisions.

The following table shows the class and source of work performed for the past 2 fiscal years:

Gross revenue—Class and source

	Fiscal year 1946		Fiscal year 1945	
	Revenues	Percent of total	Revenues	Percent of total
Class:				
Marine.....	\$7, 946, 824	73. 9	\$12, 657, 201	80. 5
Railroad.....	792, 406	7. 4	769, 534	4. 9
Fabricated stock.....	488, 767	4. 5	497, 142	3. 2
Sundries.....	1, 523, 149	14. 2	1, 792, 156	11. 4
Total.....	10, 751, 146	100. 0	15, 716, 033	100. 0
Origin:				
The Panama Canal.....	2, 420, 752	22. 5	2, 587, 423	16. 4
Panama Railroad Company.....	843, 005	7. 8	824, 468	5. 3
U. S. Army.....	1, 324, 779	12. 3	1, 883, 017	11. 9
U. S. Navy.....	1, 960, 773	18. 2	5, 005, 773	31. 3
Other United States departments.....	2, 810, 190	26. 2	3, 204, 870	20. 4
Commercial.....	1, 391, 617	13. 0	2, 210, 482	14. 7
Total.....	10, 751, 146	100. 0	15, 716, 033	100. 0

REPAIRS TO SHIPS

The following statement shows the number of vessels and the total "ship-days" for each category of vessels repaired at Balboa and Cristobal for the fiscal year 1946:

Category	Balboa		Cristobal		Total	
	Number of ships	Ship days ¹	Number of ships	Ship days ¹	Number of ships	Ship days ¹
Commercial:						
Tankers.....	428	2, 518	430	1, 568	858	4, 086
Other.....	298	1, 013	999	3, 005	1, 297	4, 018
U. S. Army.....	233	2, 068	209	1, 285	442	3, 353
U. S. Navy.....	219	1, 639	226	1, 024	445	2, 663
The Panama Canal.....	33	638	88	915	121	1, 553
Miscellaneous.....	12	94	11	156	23	250
Total, 1946.....	1, 223	7, 970	1, 963	7, 953	3, 186	15, 923
Total, 1945.....	1, 943	10, 516	2, 434	10, 959	4, 377	21, 475

¹Total days consumed in repairing number of ships indicated.

DRYDOCKS AND MARINE RAILWAYS

The following table summarizes drydock and marine-railway operations during the fiscal year 1946, with comparative figures for the 2 preceding years:

Number of vessels drydocked

Category	Fiscal year 1946			Fiscal year	
	Balboa dry-docks	Cristobal dry-docks and marine railways	Total	1945 total	1944 total
U. S. Army.....	58	35	93	121	112
U. S. Navy.....	24	41	65	269	259
Other United States departments.....	24	1	25	56	-----
Commercial.....	20	22	42	54	47
Total outside interests.....	126	99	225	500	418
The Panama Canal.....	17	20	37	46	31
Panama Railroad Company.....	2	1	3	-----	-----
Grand total.....	145	120	265	546	449

During the fiscal year 1946 there were 88 times in which one dry dock was unoccupied for 1 day at Balboa, and 220 times in which one dry dock or marine railway was unoccupied for 1 day at Cristobal.

PLANT IMPROVEMENT

At the close of the year the general shop improvement program, authorized and begun during 1946, was virtually accomplished, with only 10 projects remaining to be completed. Additional plant floor space was provided through the construction of new buildings, removal of existing facilities to more advantageous locations and the rearrangement of machinery and equipment. There were 388 pieces of new equipment and machine tools installed and placed in operation during the year. Work was continued on the installation of 60-cycle power to serve both shops and ships' service at both terminals. Two floating dry docks were furnished by the United States Navy to provide increased dry-docking facilities. One of the floating dry docks was placed in use for a period of only 3 months, the service being discontinued upon removal of special tankers for this area. At the Cristobal shops a floating pier was constructed and put in use to facilitate ship repairs.

ELECTRICAL REPAIR WORK

The principal activities of the electrical division are the operation and maintenance of the electric light and power system and the construction and maintenance of electrical facilities as required by The Panama Canal and other Government agencies, or by vessels undergoing repairs at the Canal terminals. Personnel employed in the operation and maintenance of the Panama Railroad-owned telephone, telegraph, electric clock, printing telegraph, and railway signal systems was transferred to the Panama Railroad organization on July 1, 1945. Following is a comparison of the two principal classes of expenditures of the electrical division for the past 3 fiscal years:

	Fiscal year		
	1946	1945	1944
Electrical construction and maintenance work.....	\$1,906,426	\$2,339,477	\$2,863,306
Maintenance and operation of:			
Electric power system.....	1,061,305	1,173,630	1,039,388
Telephone system and railway signals.....		243,180	266,424

Among the principal projects of electrical work carried on during the year were the wiring of newly constructed gold and silver quarters, the wiring of silver high schools, and the installation of 60-cycle equipment in the mechanical division shops area at Balboa.

Information concerning the principal construction projects undertaken and the operation of the power system are given on page 30 of this report, under the general heading of "Canal operation." The expenditures shown above include interdepartmental transactions. As an example, maintenance and repairs on the power system are performed by the electric work unit and the cost of this work is therefore included in the expenses of both the power system and the electric work unit.

PURCHASES AND INSPECTIONS IN THE UNITED STATES

The principal purchases of supplies for The Panama Canal were made, as heretofore, through the Washington office of The Panama Canal; the volume of the purchases is indicated by the following table:

	Fiscal year		
	1946	1945	1944
Number of purchase orders placed.....	8,206	9,543	8,931
Value of orders placed.....	\$6,355,766	\$7,414,466	\$5,418,842
Number of disbursement vouchers prepared.....	17,514	13,369	20,884
Value of above vouchers.....	\$9,935,612	\$7,660,469	\$11,352,061
Number of collection vouchers prepared.....	476	519	708
Value of above vouchers.....	\$1,333,763	\$1,685,657	\$2,206,937
Cash discounts taken.....	\$36,152	\$32,603	\$40,757

STOREHOUSES AND SHIP CHANDLERY

In addition to the main function of requisitioning, storing and issuing general supplies for the Canal and Railroad (exclusive of the merchandising operations of the commissary division) the Panama Canal storehouses sell ship chandlery and other supplies to commercial

shipping as well as to units of the United States Army and Navy. The following figures indicate the volume of material and supplies cleared through the stores accounts during the past 3 years:

	Fiscal year		
	1946	1945	1944
<i>General storehouses</i>			
Gross revenues, sales and issues.....	\$9, 878, 899	\$12, 497, 371	\$17, 040, 252
Cost of materials, plus operating expense.....	9, 878, 899	12, 456, 774	16, 997, 995
Net revenues.....	0	40, 597	42, 257
Inventory as of June 30 ¹	\$9, 523, 446	\$8, 960, 137	\$10, 834, 536

¹ This includes all material and supplies of The Panama Canal, by far the greater part of which is in the general storehouse.

OBsolete AND UNSERVICEABLE PROPERTY AND EQUIPMENT

During the year disposition was made by sale, or by destruction where the items had no money value, of obsolete or unserviceable property and equipment which had an original value of \$634,035. Replacements were made as necessary.

BULK PETROLEUM PRODUCTS

All deliveries of fuel oil, Diesel oil, gasoline, and kerosene to and from storage tanks, for private companies and for the Panama Canal, and some deliveries for the United States Navy, are made through pipe lines and pumping plants of the Panama Canal. The following table summarizes the operation of the oil handling plants for the past 3 years:

	Fiscal year		
	1946	1945	1944
Fuel and Diesel oil:	<i>Barrels</i>	<i>Barrels</i>	<i>Barrels</i>
Received by The Panama Canal.....	331, 016	435, 684	505, 950
Used by The Panama Canal.....	317, 846	372, 721	411, 491
Sold by The Panama Canal.....	19, 506	24, 124	29, 346
Miscellaneous transfers on tank farms.....	16, 693	27, 893	24, 643
Pumped for outside interests.....	30, 081, 448	32, 156, 533	23, 659, 364
Total barrels handled.....	30, 766, 509	33, 016, 955	24, 630, 794
Handled at Mount Hope (Atlantic side).....	19, 286, 943	14, 211, 063	11, 886, 897
Handled at Balboa (Pacific side).....	11, 479, 566	18, 805, 892	12, 743, 897
Total barrels handled.....	30, 766, 509	33, 016, 955	24, 630, 794
Number of ships discharging or receiving fuel and Diesel oil:			
Panama Canal craft.....	250	290	215
All others.....	3, 655	3, 370	2, 431
Total.....	3, 905	3, 660	2, 646
Gasoline and kerosene received:			
By The Panama Canal:	<i>Gallons</i>	<i>Gallons</i>	<i>Gallons</i>
Bulk gasoline.....	11, 665, 836	12, 578, 076	11, 162, 293
Bulk kerosene.....	2, 950, 773	2, 655, 954	2, 612, 310
By outsiders:			
Bulk gasoline.....	29, 399, 902	23, 001, 664	31, 496, 430
Bulk kerosene.....	6, 242, 856	3, 427, 913	1, 709, 148
Financial results of operations:			
Total revenues.....	\$2, 101, 440	\$1, 583, 027	\$1, 548, 701
Total expenditures (including cost of sales).....	2, 042, 160	1, 328, 820	1, 179, 789
Net revenues.....	59, 280	254, 207	368, 912

BUILDING, CONSTRUCTION AND MAINTENANCE

The program of construction under way at the end of the fiscal year 1945 was continued in 1946.

The principal projects of building construction for The Panama Canal and Panama Railroad Company completed by the building division of The Panama Canal are shown in the following paragraphs. Unless otherwise specified, the projects listed are new buildings:

Ancon-Balboa.—One type 104 and seven type 112 family quarters; paint shop facilities, mechanical division; storage building No. 3, mechanical division; utility and dispensary buildings for the health department; and alterations and extensions to the Ancon Clubhouse restaurant.

Red Tank.—Dispensary building and additions to the junior high school.

Pedro Miguel.—Three locomotive pit shelters at the Pedro Miguel locks.

Paraiso.—School building; three frame quarters; and five masonry quarters.

Margarita.—One type 102 quarters building.

Gatun.—Locomotive pit shelter.

In addition to the principal projects listed above, which were completed during the year for The Panama Canal and the Panama Railroad Company, work was performed for the Army and Navy and for employees.

The volume of operations totaled \$4,268,083, an increase of \$446,000 over the previous year. Work for the Army and Navy was about \$300,000 less than in the previous year but this was more than offset by repair and maintenance work for Canal divisions and new quarters construction. Work performed for employees remained at about the same level as the previous year. The cost of maintenance and repair work performed during the fiscal year 1946 aggregated \$1,663,938, of which \$601,858 was expended on maintenance of quarters occupied by gold employees and \$203,918 on maintenance of quarters occupied by silver employees; the balance of \$858,162 was spent on all other maintenance work performed by the building division.

The total volume of construction and maintenance work for the past 3 years is summarized as follows:

	Fiscal year		
	1946	1945	1944
For Canal divisions:			
Repair and maintenance work.....	\$1, 185, 122	\$829, 119	\$809, 360
Construction work.....	2, 146, 421	1, 717, 455	3, 101, 859
For the Panama Railroad Company:			
Repair and maintenance work.....	127, 632	95, 424	71, 888
Construction work.....	136, 222	119, 522	81, 233
For other departments of the Government, employees, and others.....	672, 686	1, 060, 560	1, 841, 357
Total.....	4, 268, 083	3, 822, 080	5, 905, 697
Total maintenance.....	1, 663, 938	1, 274, 637	1, 183, 585
Total construction.....	2, 604, 145	2, 547, 443	4, 722, 112
Total.....	4, 268, 083	3, 822, 080	5, 905, 697

QUARTERS FOR EMPLOYEES

Gold employees.—Replacement construction of quarters, which was discontinued in 1943, was resumed during 1946. Sixteen apartments in two-family houses were completed in the Ancon-Balboa district. One cottage at Margarita was completed and at Cristobal the construction of 34 apartments in two-family houses was well advanced at the close of the year. Several condemned quarters, the maintenance of which is paid for by the occupants, are still in use. Under existing regulations employees are required to have an assignment to family quarters before permission is granted for their families to come to the Canal Zone.

On June 30, 1945, there were 243 applications for family quarters from regular employees in all districts, and on June 30, 1946, 121 were on file, a decrease of 122 from the previous year. A gradual discontinuance of wartime activities and the consequent reduction in the number of employees constitutes the main factor in this reduction in the number of applications.

No changes were made in the general regulations governing assignment and rental of quarters to American employees.

Silver employees.—The operation of quarters for silver employees was continued on substantially the same basis as in previous years. Construction of experimental types of housing units, representing a marked improvement in facilities for this group of employees, was started during the year. Ten buildings containing 26 apartments were completed at Silver City and 8 buildings containing 22 apartments were completed at Paraiso. The development of new types has been a matter of continual study throughout the year. The laborers' barracks at Gatun remained closed. The remaining barracks building in use at Cocoli will be closed shortly after the beginning of the fiscal year 1947 when the occupants thereof will be transferred to quarters at La Boca which will become vacant because of the repatriation of contract laborers.

The demand for quarters for silver employees is still far in excess of supply. As of June 30, 1946, there were 903 applications on file for family quarters and 857 applications for bachelor quarters, a total of 1,760 as compared with 2,292 on file June 30, 1945.

MOTOR TRANSPORTATION

The motor transportation division is charged with the operation and maintenance of motor transportation for the departments and divisions of The Panama Canal and Panama Railroad Company. The centralization of transportation facilities in this division and the requirement that it be operated on a self-sustaining basis have been primarily for the purpose of supplying needed transportation at minimum cost to The Panama Canal and Panama Railroad Company. Repair work is also performed for employees and for contractors engaged in work for the Government in the Canal Zone.

The public transportation system of privately owned busses under the supervision and control of the motor transportation division, continued to carry employees and their families in and between the various towns in the Canal Zone; 150 busses were operating in this service as of June 30, 1946.

Revenues of the division during the past year, including motor car repair shop activities, totaled \$1,919,690, and the expenses \$1,905,180 which left a net revenue of \$14,510.

In the fiscal year 1946, 7 cars and trucks, 1 trailer and 2 motorcycles were purchased, and 16 cars and trucks were retired. At the close of the fiscal year 842 cars and trucks, 35 trailers, and 7 motorcycles were on hand.

PANAMA CANAL PRESS

The operations of the Panama Canal Press were continued under the same policies as heretofore. The printing plant carries stocks of materials, and prints such forms, stationery, etc., as are required on the Isthmus in connection with the operation of The Panama Canal and the Panama Railroad Company.

The following is a summary of the financial operations of this plant during the past 3 years:

	Fiscal year—		
	1946	1945	1944
Gross sales revenues.....	\$475, 757	\$518, 594	\$492, 782
Total expenses (including cost of materials used in manufacturing and cost of stationery stores not processed).....	465, 375	506, 347	486, 730
Net revenues.....	10, 382	12, 247	6, 052

SUBSISTENCE

The subsistence section, which was set up on May 1, 1941, to provide meals for contract laborers brought to the Isthmus in connection with the large construction program, continued under the same policies as in the previous year. Operations were on a larger scale than in 1945 because of the necessity of further expanding operations in the mechanical division early in the fiscal year 1946. The La Boca, Gamboa, Camp Bierd, and Cocoli messes were in operation throughout the year, but it is expected that the Cocoli mess will be closed early in the fiscal year 1947.

In the fiscal year 1946 a total of 4,155,186 meals or 1,385,062 rations were served by this unit, an increase of 42 percent in comparison with the number served in 1945. The ration cost was \$0.443 per day in the fiscal year 1946 as compared with \$0.413 in the fiscal year 1945.

REVENUES DERIVED FROM THE RENTAL OF LANDS IN THE CANAL ZONE

Rentals for building sites and oil-tank sites in the Canal Zone totaled \$23,942 for the year as compared with \$35,162 for the fiscal year 1945. Rentals from agricultural land in the Canal Zone totaled \$7,097 as compared with \$7,755 for the preceding year. At the close of the fiscal year 687 licenses were in effect, covering 1,346 hectares of

agricultural land within the Canal Zone. This is a reduction of 41 in the number of licenses as compared with the previous fiscal year and a reduction in the area held under licenses of 70½ hectares. This reduction is largely the result of the policy adopted as a health measure in May 1935, that no more licenses for agricultural land would be issued and that holdings under licenses previously granted shall not be sold or transferred.

BUSINESS OPERATIONS UNDER THE PANAMA RAILROAD COMPANY

The Panama Railroad Company was incorporated in 1849 under the laws of the State of New York for the purpose of constructing and operating a railroad across the Isthmus. When the concession, rights, and property of the New French Canal Co. were purchased in 1904, ownership of the stock of the Panama Railroad Company was transferred to the United States Government. Since the acquisition of the railroad by the United States, its corporate status has been preserved and the railroad has continued to function as a common carrier.

At the beginning of Canal construction work, by Executive order of the President of the United States, the Panama Railroad Company was made an adjunct to The Panama Canal. Its operations are supervised by a board of directors functioning under the direction of the Secretary of War. As the operations of the railroad complement those of the Canal, the policy has been for the board of directors to elect the Governor of The Panama Canal as president of the Panama Railroad Company. Thus, the Governor of The Panama Canal is the administrative head of the Panama Railroad Company. This practice has insured complete coordination of the activities conducted by the two organizations.

As the activities of the Railroad Company are covered in detail in its annual report, only the major features of operation as they relate to Canal administration are covered in this section.

In addition to the operations of the trans-Isthmian railroad, the business enterprises conducted by the Panama Railroad Company include the following: The loading, unloading, storage, and transfer of cargo for shipping interests at the terminal ports; the operation of wholesale warehouses, retail stores, and subsidiary manufacturing plants engaged in the supply of food, clothing, and other essential commodities to governmental agencies and to Government employees and their families; and the operation of coaling plants, hotels, a dairy, and a laundry.

TRANS-ISTHMIAN RAILROAD

The railroad line operates between Colon, the Atlantic terminus, and Panama City, the Pacific terminus. In addition to those cities, the railroad serves all nearby activities of The Panama Canal. Gross revenues from the operations of the railroad proper (not including subsidiary business activities) during the fiscal year 1946 amounted to \$3,177,256. Revenue freight totaled 539,292 tons, as compared with 590,610 tons during 1945, a decrease of 51,318 tons.

Comparative statistics covering the significant features of railroad operations during the past 3 years are presented in the following table:

	Fiscal year		
	1946	1945	1944
Average miles operated, Colon to Panama.....	50.93	50.93	47.61
Gross operating revenue.....	\$3,177,256	\$3,244,226	\$3,520,081
Number of passengers carried:			
First-class.....	336,610	352,191	358,907
Second-class.....	444,899	429,627	487,840
Total.....	781,509	781,818	846,747
Revenue per passenger-train-mile.....	\$5.52	\$5.55	\$5.79
Revenue per freight-train-mile.....	\$23.69	\$19.57	\$16.30
Passenger train mileage.....	150,170	152,412	161,836
Freight train mileage.....	139,879	155,938	208,277
Work train mileage.....	6,695	6,633	4,079
Total train mileage.....	296,744	314,983	374,192
Switch locomotive miles.....	168,225	180,279	232,933

RECEIVING AND FORWARDING AGENCY

This division handles the dock and harbor activities of the Panama Railroad Company at the two terminals of the Canal. The following statistics summarize the results of operations for the past 3 years:

	Fiscal year		
	1946	1945	1944
Total revenue.....	\$2,495,292	\$2,838,626	\$3,364,189
Total cargo handled and transferred across docks.....	<i>Tons</i> 1,237,155	<i>Tons</i> 1,374,679	<i>Tons</i> 1,734,556
Cargo stevedored by Panama Railroad Company.....	404,103	444,476	673,209
Cargo ships handled.....	2,363	2,533	1,767
Agency services furnished vessels.....	137	99	50

COALING PLANTS

The volume of coaling plant operations at Cristobal and Balboa for the past 3 years is shown in the following table:

	Fiscal year		
	1946	1945	1944
Gross revenues.....	\$668,375	\$927,391	\$1,308,907
Coal sold.....	<i>Tons</i> 32,528	<i>Tons</i> 43,627	<i>Tons</i> 59,750
Coal purchased.....	31,122	42,279	53,282

TELEPHONE SYSTEM

Gross revenues received from the operation of telephones, electric clocks, and electric printing telegraph machines totaled \$386,496.

During the year 1,467 telephones were installed or reconnected and 1,874 were discontinued or removed, resulting in a net decrease of 407 telephones for the year. At the end of the fiscal year 1946 there were in service 5,267 telephones, as well as 55 electric clocks and 44 automatic printing telegraph typewriters. Telephone calls handled through the automatic exchanges averaged 110,262 calls per day in 1946 and 127,681 per day in 1945 during the sample days tested. This represents an average of 20.9 calls per telephone per day in 1946, as compared with 22.5 in 1945.

COMMISSARY DIVISION

The primary function of the commissary division of the Panama Railroad Company is to supply at reasonable prices food, clothing, and household supplies to meet the needs of United States Government personnel and the various United States Government departments on the Isthmus. In carrying out this function the division operates wholesale warehouses and cold-storage plants as well as retail stores in each of the Canal Zone towns. Sales are restricted to agencies and personnel of the United States Government, except that ice, cold storage, food, and other essentials may be purchased by commercial steamships passing through the Canal or calling at its terminal ports.

SALES

Net sales for the fiscal year 1946 totaled \$37,126,703, compared with \$38,134,705 for the previous fiscal year. The value of merchandise on hand June 30, 1946, was \$4,391,680 compared with \$3,794,231 at the close of the fiscal year 1945. The ratio of sales to inventory indicates a theoretical stock turn-over approximately every 8½ weeks. The distribution of sales for the past 3 fiscal years is shown in the following table:

	Fiscal year—		
	1946	1945	1944
U. S. Government (Army and Navy).....	\$2, 846, 043	\$4, 807, 204	\$9, 793, 040
The Panama Canal.....	3, 929, 709	3, 919, 390	4, 170, 701
The Panama Railroad.....	435, 360	409, 118	419, 719
Individuals and companies.....	1, 164, 454	1, 560, 284	2, 072, 333
Commercial ships.....	5, 766, 264	5, 271, 972	1, 596, 607
Employees.....	24, 263, 250	23, 473, 518	23, 183, 746
Gross sales.....	38, 405, 080	39, 441, 486	41, 236, 146
Less discounts, credits, etc.....	1, 278, 377	1, 306, 781	2, 015, 719
Net sales.....	37, 126, 703	38, 134, 705	39, 220, 427

PURCHASES

Purchases during the year aggregated \$31,339,418, an increase of \$1,519,944 over the previous year. The following tabulation shows the value of the various classes of merchandise purchased for the past 3 years:

	Fiscal year		
	1946	1945	1944
Groceries.....	\$8,026,090	\$8,277,928	\$8,254,247
Candies and tobacco.....	1,078,020	1,055,372	1,185,909
Housewares.....	1,603,321	1,414,161	1,508,613
Drygoods.....	4,872,129	4,233,129	3,507,543
Shoes.....	1,764,736	1,374,896	1,431,202
Cold storage.....	7,399,124	7,198,676	9,319,656
Raw material.....	1,917,218	1,895,271	1,881,940
Cattle.....	1,062,968	1,266,479	1,478,063
Milk and cream.....	384,539	423,384	361,327
Dairy products.....	3,231,273	2,680,178	3,635,199
Total.....	31,339,418	29,819,474	32,563,699

HOTELS

The Hotels Tivoli and Washington were operated by the Panama Railroad Company without change of policy during the year. These hotels are an essential adjunct to the Canal, providing necessary accommodations for foreign visitors, American tourists, visiting Government officials, and others.

The gross revenue from hotels was \$994,341, as compared with \$992,879 in 1945, and the number of guest days was 102,632 compared with 98,516 in 1945.

MINDI DAIRY

The operation of the Mindi Dairy continued as in previous years. Milk production for the year was 473,387 gallons, compared with 482,296 gallons in the preceding year, a decrease of 8,909 gallons. Fresh milk is furnished to the hospitals and, on doctors' prescriptions, to invalids, infants, and nursing mothers. The surplus remaining after these needs are met is available for purchase by employees, units of the Canal and Railroad organizations, and Army and Navy units stationed on the Isthmus.

PANAMA LINE

The Panama Railroad Company's steamship interests, the Panama Line, continued inactive insofar as normal operations of its service between New York and the Canal Zone were concerned. During the year, however, the Line's three combination passenger-cargo steamers *Panama*, *Cristobal*, and *Ancon* were returned to their owner after serving several years in direct war service of the United States Government. The *Panama*, which was taken over by the War Department in June 1941, was returned to the Line on May 15, 1946, and the *Ancon* and *Cristobal*, relinquished for direct war service in

January 1942, were returned February 25, 1946, and June 14, 1946, respectively. The vessels suffered no major damage during the war period. The *Panama* and *Cristobal* were operated by the United States Army as troop transports while the *Ancon* after being utilized as a troop transport for a short period was converted by the United States Navy into a communications and command ship. At the end of the year, the three vessels were undergoing repairs and general reconditioning preparatory to resuming their normal service between New York and the Canal Zone. It is expected that the *Panama* will be in its regular prewar run by September 1946, and that the *Ancon* and *Cristobal* will follow later in the year.

The restoration of these vessels to their prewar service will bring long-awaited relief to the employees of The Panama Canal and the Panama Railroad Company who, in the past 5 years, have lacked adequate transportation between the Isthmus and the United States. During this period the majority of these employees and their families have remained on the Isthmus far beyond the time when, in the interests of their health, efficiency and morale, a change from the Tropics to a temperate climate was advisable.

SECTION III

ADMINISTRATION

DEPARTMENTS

The organization of The Panama Canal on the Isthmus embraces five principal departments, namely, operation and maintenance, supply, accounting, executive, and health. In addition, an office of The Panama Canal is maintained in Washington, D. C. The Panama Railroad Company, a Government-owned corporation conducting business enterprises on the Isthmus, is a distinct unit, but it is closely affiliated with and operated as an adjunct to The Panama Canal.

OPERATION AND MAINTENANCE

The department of operation and maintenance includes the management functions and those directly involved in the operation and maintenance of the Canal as a waterway, including the dredged channel, locks, dams, aids to navigation, accessory activities such as shops and drydocks, vessel inspection, electrical and water supply, sewer systems, roads and streets, hydrographic observations, surveys and estimates, and miscellaneous construction other than the erection of buildings. Construction of the third locks, now in a suspended status, and investigation of means of increasing the capacity and security of the Panama Canal also are included in this department.

SUPPLY

The supply department is charged with the acquisition, storage, and distribution of materials and supplies for The Panama Canal and Railroad; the maintenance and construction of buildings; the assignment of living quarters; care of grounds; the operation of storehouses, oil handling plants, an experiment garden, and a printing plant; the supplying of motor transportation facilities for the various departments and divisions of the Canal and Railroad organizations; and the operation of messes for contract labor.

ACCOUNTING

The accounting department is responsible for the correct recording of financial transactions of the Canal and Railroad; the administrative auditing of vouchers covering the receipt and disbursement of funds preliminary to the final audit by the General Accounting Office; cost keeping of Canal and Railroad; the preparation of estimates for appropriations; and the examination of claims.

EXECUTIVE

The executive department embraces the civil government functions including the administration of police and fire protection, postal service, customs, shipping commissioner duties, estates, schools and,

in addition, the general correspondence and records of The Panama Canal and Panama Railroad Company, the personnel administration, wage adjustments, general information, relations with Panama, and the operation of clubhouses, restaurants, and moving picture theaters.

HEALTH

The health department has jurisdiction over all matters pertaining to sanitation and public health within the Canal Zone and the cities of Panama and Colon, the operation of hospitals and dispensaries, and the enforcement of quarantine regulations.

PANAMA RAILROAD COMPANY

The operations of the Panama Railroad Company on the Isthmus are carried on as an adjunct to The Panama Canal. As the Governor of The Panama Canal is also president of the Panama Railroad Company, the heads of all departments, both of the Canal and Railroad organizations, report to him.

CHANGES IN ADMINISTRATIVE PERSONNEL

Lt. Comdr. W. C. Bathelt, United States Naval Reserve, was appointed assistant to the marine superintendent on August 8, 1945, vice Lt. Comdr. A. W. Weir, United States Naval Reserve, relieved from duty with The Panama Canal.

Col. G. M. Powell, United States Army, was appointed assistant chief health officer on August 13, 1945, vice Col. Albert R. Dreisbach, United States Army, relieved from duty with The Panama Canal.

Mr. Vincent J. Clarke was appointed general manager, commissary division, on September 27, 1945, vice Mr. Arthur W. Goulet, deceased.

Mr. J. Wendell Greene was appointed paymaster, The Panama Canal, on October 1, 1945, vice Mr. James H. Smith, retired.

Col. James G. Steese, United States Army (retired), was appointed assistant to the Governor, November 13, 1945.

Col. Richardson Selee, United States Army, was appointed assistant engineer of maintenance on November 13, 1945, vice Col. James G. Steese, United States Army (retired), appointed assistant to the Governor.

Mr. W. B. Heite was appointed superintendent, motor transportation division, on January 1, 1946, vice Mr. Samuel Grier, retired.

Dr. C. C. Clay was appointed manager, Mindi Dairy, on March 1, 1946, vice Dr. T. L. Casserly, retired.

Col. Hugh A. Kelly, Army of the United States, military assistant to the Governor, was relieved from duty with The Panama Canal on April 22, 1946.

Mr. W. B. Jones was appointed chief of customs and deputy shipping commissioner, Port of Balboa, on May 1, 1946, vice Mr. H. C. Ingersoll, retired.

Mr. J. T. Glancy was appointed chief of customs and deputy shipping commissioner, Port of Cristobal, on May 1, 1946, vice Mr. W. B. Jones appointed chief of customs and deputy shipping commissioner, Port of Balboa.

Col. J. H. Stratton, United States Army, was appointed supervising engineer, special engineering division, May 6, 1946.

Commander H. H. Horne, United States Naval Reserve, was appointed assistant to the marine superintendent on May 19, 1946, vice Lt. Comdr. W. C. Bathelt, United States Naval Reserve, relieved from duty with The Panama Canal.

CHANGES IN ADMINISTRATIVE ORGANIZATION

TELEPHONE AND SIGNAL DIVISION

Effective July 1, 1945, there was established the telephone and signal division of the Panama Railroad Company under the immediate supervision and direction of the electrical engineer, Panama Railroad Company. Effective the same date, the organization and personnel of the telephone section and railway signals units of the electrical division of The Panama Canal were transferred to the telephone and signal division of the Panama Railroad Company.

PAY ROLL BUREAU

Effective July 1, 1945 a pay-roll bureau was established in the executive department under the direction of the executive secretary. The function of the pay-roll bureau is to prepare such pay rolls of The Panama Canal and Panama Railroad Company as are assigned to it and to perform such other duties related thereto as may be required.

EMPLOYEES

The force employed by The Panama Canal and the Panama Railroad Company is composed of two classes which for local convenience have been designated "gold" and "silver" employees. The terms "gold" employees and "silver" employees originated during the construction period of the Canal from the practice of paying in silver coin common laborers and other unskilled or semiskilled workers employed in the Tropics, while skilled craftsmen and those occupying executive, professional, and similar positions were paid in gold coin, the latter group being recruited largely from the United States. Although all employees are now paid in United States currency, the original terms used to designate the two classes of employees have been retained for convenience. The terms "gold" and "silver" are applied also to quarters, commissaries, clubhouses, and other public facilities.

The gold employees—that is, those carried on the gold pay roll—comprise those employees who are engaged in the skilled trades and in the executive, supervisory, professional, subprofessional, clerical, and other positions where education, training, and special qualifications are required. The force of silver employees is composed almost entirely of natives of the Tropics, a considerable number of whom are Panamanians. They are employed principally as laborers, helpers, and semiskilled workers on work which does not require the services of highly trained or qualified persons.

Responsibility for personnel administration in The Panama Canal is vested in the division of personnel supervision and management, executive department.

GOLD EMPLOYEES

The distribution of the gold personnel on June 28, 1946 and on June 30, 1945, is shown in the following tabulation:

	As of		Increase	Decrease
	June 28, 1946	June 30, 1945		
THE PANAMA CANAL				
Accounting department.....	283	288		5
Dredging division.....	316	348		32
Gravel plant.....	3	3		
Thatcher Ferry.....	31	23	8	
Electric power system.....	54	53	1	
Electric work.....	177	291		114
Locks division.....	359	302	57	
Marine division.....	242	247		5
Mechanical division.....	878	1, 859		981
Meteorology and hydrography.....	11	10	1	
Municipal work.....	172	162	10	
Sosa Hill quarry.....	6	5	1	
Water system.....	44	46		2
Office engineering.....	111	99	12	
Special engineering division (third locks).....	132	31	101	
Offices of:				
Governor.....	4	4		
Comptroller.....	7	6	1	
Engineer of maintenance.....	12	11	1	
Assistant engineer of maintenance.....	4	8		4
Executive secretary.....	5	8		3
General counsel.....	4	5		1
Aeronautics section.....	5	3	2	
Civil affairs division.....	62	42	20	
Clubhouses.....	103	133		30
Collector.....	20	19	1	
Correspondence and records.....	49	44	5	
Library.....	10	8	2	
License bureau.....	5	8		3
Magistrates' courts.....	8	6	2	
Paymaster.....	18	16	2	
Pay-roll bureau.....	32	25	7	
Personnel division.....	111	122		11
Police section (including civil intelligence).....	243	235	8	
Fire section.....	78	75	3	
Bureau of posts.....	173	73	100	
Schools division.....	133	125	8	
Physical education and recreation.....	22	26		4
Building division.....	228	172	56	
Buildings and grounds.....	64	65		1
Gasoline stations.....	2	1	1	
Motor transportation.....	199	192	7	
Oil-handling plants.....	54	50	4	
Panama Canal Press.....	16	14	2	
Quarters, subsistence.....	10	8	2	
Storehouses.....	119	115	4	
Sanitation:				
Gorgas Hospital.....	333	339		6
All other units.....	287	304		17
* Total, The Panama Canal.....	5, 239	6, 029	429	1, 219
Net decrease.....				790
PANAMA RAILROAD COMPANY				
General manager.....	132	121	11	
Receiving and forwarding agency.....	117	120		3
Commissary division.....	362	349	13	
Mindi Dairy.....	5	5		
Hotels.....	27	22	5	
Telephone and signal division.....	36	39		3
Total, Panama Railroad Company.....	679	656	29	6
Net increase.....			23	
Total force.....	5, 918	6, 685	458	1, 225
Net decrease.....				767

NOTE.—The above distribution has been revised to conform with the budgetary classification adopted July 1, 1945.

A reduction of 767, or 11.5 percent, occurred in the over-all gold force as compared with the number employed on June 30, 1945. The principal reductions were in the electric work unit, down 39 percent; the mechanical division, down 53 percent; clubhouses, down 23 percent; and the dredging division, down 9 percent. Opposing this trend were increases in four divisions. The force of the locks division increased 19 percent largely through the necessity of employing personnel to guard the locks, a function previously performed by the Army. The increase of 101 employees for the special engineering division was due to the initiation of studies during the year on investigations of means for increasing the capacity and security of the Panama Canal. The increase of 100 in the bureau of posts resulted from the return to civilian control during the year of 13 Army and Navy post offices. Resumption of building programs which had been interrupted by the war resulted in an increase of 56 in the force of the Building Division.

RECRUITING AND TURN-OVER OF FORCE—GOLD EMPLOYEES

The following table shows additions to and separations from the gold force of The Panama Canal and the Panama Railroad Company during the fiscal year 1946:

	Panama Canal	Panama Railroad	Total
Additions.....	1,841	200	2,041
Separations:			
Resignation.....	1,501	137	1,638
To enter military service.....	66	4	70
Reduction in force.....	493	6	499
Termination of temporary employment or reassignment.....	198	4	202
Removal for cause.....	75	5	80
Retirement:			
Age.....	57	14	71
Disability.....	13	3	16
Optional.....	27	1	28
Disability—not qualified for retirement.....	13		13
Inefficiency.....	4		4
Transfer (to other departments of Government).....	22	1	23
Disqualified in trial period.....	2	1	3
Death.....	12	5	17
Total separations.....	2,483	181	2,664
Net separations.....	642		623
Net additions.....		19	

NOTE.—The above figures do not include 156 terminations of employees on part-time or irregular basis, or 6 terminations of American citizens on the silver roll.

As the figures of net separations in the table above were taken from the weekly personnel reports, which usually lag a week or 10 days behind the actual termination dates, there is a difference of 144 in the number of net separations and the net decrease in force as shown on page 61. The actual net decrease in force was 767 as shown on page 61.

Based on an average aggregate gold force of 6,198 for the period covered, the 2,664 separations from all causes shown in the foregoing table represent a turn-over of 43 percent, as compared with 25 percent reported for 1945. When separations by reassignment or expira-

tion of temporary employment are excluded, the turn-over rate is 39.7 percent for 1946 as compared with 23.8 percent for 1945; and when separations due to reduction of force are also excluded, the rate for 1946 is 31.7 percent as compared with 22 percent for 1945.

Employment.—Of the 2,041 additions to the force during the fiscal year, 810 were employed or reemployed in the United States; of this number 736 were employed by The Panama Canal and 74 by the Panama Railroad Company. Due to the cutting back of United States recruitment at the time hostilities terminated in August 1945, the number of local employments was greater than the number appointed in the United States. With the suspension or cancelation of many requisitions after August 15, it was expected that recruitment and employment, except for veteran restoration, would drop to a low level; however, this expectation was not realized due largely to the increase in the rate of turn-over during the period from September 1945 through May 1946. Although the manpower controls of the War Manpower Commission and the Civil Service Commission were relaxed in September 1945, and selective service inductions were limited to low-age groups, recruitment in the United States has been very difficult, particularly in securing well-qualified craft personnel. During the year there were 465 veteran restorations.

At the close of the fiscal year 1946, there were requisitions for 259 employments pending, including 71 for restoration of returning veterans. These unfilled requisitions were largely for the schools division, the health department, the mechanical division, and the special engineering division.

For appointments made during the year, the time interval between date of nomination and arrival of the employee on the Isthmus averaged 50 days. Although the relaxation of manpower controls and the simplification of employment procedures following the end of hostilities tended to reduce the time lapse, arrivals in general were unduly delayed throughout the year as the result of increasing difficulties in obtaining air transportation to the Isthmus. It was necessary during 1946 to rely almost entirely on transportation by plane from the United States, and the revocation of priority regulations on air travel made it more and more difficult to get reservations in competition with the steadily expanding traffic, tourist and otherwise, moving between the United States and points in Central and South America by commercial air carriers. It is expected that the transportation problem will be eased early in 1947, when the Panama Line steamers are returned to active service.

ADJUSTMENT IN WAGES AND HOURS OF WORK

Major salary and wage changes that became effective during the fiscal year 1946 provided increases for the following: Classified and related employees; postal employees; policemen and firemen; school teachers; floating-equipment personnel; printing plant employees; personnel of the transportation division of the Panama Railroad Company; and craft employees whose rates were based on naval shipyard rates.

The 48-hour administrative workweek established January 1, 1943, was discontinued September 8, 1945, and an administrative 40-hour week was placed in effect September 9, 1945.

SILVER EMPLOYEES

The following table shows a comparison between the silver force of The Panama Canal and Panama Railroad Company on June 28, 1946, and June 30, 1945. The data include all full-time employees carried on the pay roll even though absent from work on the given day. Part-time employees numbering 38 on June 28, 1946, and 150 on June 30, 1945, are not included.

	As of—		Increase	Decrease
	June 28, 1946	June 30, 1945		
THE PANAMA CANAL				
Accounting department.....	6	6		
Dredging division.....	1,599	1,965		366
Gravel plant.....	14	52		38
Thatcher Ferry.....	79	74	5	
Electric power system.....	104	113		9
Electric work.....	286	403		117
Locks division.....	983	954	29	
Marine division.....	1,059	1,141		82
Mechanical division.....	1,355	2,795		1,440
Meteorology and hydrography.....	25	24	1	
Municipal work.....	1,427	1,252	175	
Sosa Hill quarry.....	94	78	16	
Water system.....	32	110		78
Office engineering.....	98	94	4	
Special engineering division (third locks).....	116	32	84	
Aeronautics section.....	22	17	5	
Civil affairs division.....	3	2	1	
Clubhouses.....	1,507	1,777		270
Correspondence and records.....	44	39	5	
Library.....	3	3		
License bureau.....	1		1	
Magistrates' courts.....	2	2		
Paymaster.....	3	3		
Pay-roll bureau.....	15	11	4	
Personnel division.....	27	30		3
Police section (including civil intelligence).....	53	53		
Bureau of posts.....	49	40	9	
Schools division.....	156	140	16	
Physical education and recreation.....	33	32	1	
Building division.....	1,992	1,931	61	
Buildings and grounds.....	554	606		52
Gasoline stations.....	26	19	7	
Motor transportation.....	628	537	91	
Oil-handling plants.....	133	114	19	
Panama Canal Press.....	143	142	1	
Quarters:				
Janitors.....	209	210		1
Subsistence.....	148	174		26
Storehouses.....	533	568		35
Sanitation:				
Gorgas Hospital.....	630	733		103
All other units.....	1,140	1,103	37	
Total, The Panama Canal.....	15,331	17,379	572	2,620
Net decrease.....				2,048
PANAMA RAILROAD COMPANY				
General manager.....	556	491	65	
Receiving and forwarding agency.....	2,107	2,533		426
Commissary division.....	3,501	3,507		6
Mindi dairy.....	140	138	2	
Hotels.....	276	266	10	
Telephones and signal division.....	33	33		
Total, Panama Railroad Co.....	6,613	6,968	77	432
Net decrease.....				355
Total force.....	21,944	24,347	649	3,052
Net decrease, total force.....				2,403

NOTE.—The above distribution has been revised to conform with the budgetary classification adopted July 1, 1945.

There was a decrease of 9.9 percent in the over-all silver force in comparison with June 30, 1945. As in the case of the gold force, the decrease reflected the return of Panama Canal activities to a normal operating basis following the end of active hostilities. The largest numerical declines were in the dredging division, electric work, mechanical division, clubhouses, Gorgas Hospital, marine division, and the receiving and forwarding agency of the Panama Railroad Company. Increases occurred in certain units, however, among which were 175 additional employments for municipal work and 91 for the motor transportation division, these being largely due to the prosecution of additional major construction projects in the Republic of Panama. The increase of 61 in the building division resulted principally from the resumption of building programs interrupted by the war. The increase in force of the special engineering division resulted from the inauguration of new studies to investigate means for increasing the capacity and security of the Panama Canal.

At the beginning of the fiscal year 1946 the Canal force was working on a 48-hour week with overtime. During the year the working hours were shifted to a straight 40-hour week, with few exceptions, and the employment of additional personnel as a consequence of this change has accounted for part of the increase in some of the units where the force was expanded during the year.

SILVER WAGES

Wages of employees of the silver roll bear no direct relationship to wages of corresponding classes of workers in the United States. As silver-roll employees are for the most part natives of the Tropics, their wage scales are established at levels which will ensure a standard of living comparing favorably with that prevailing for similar workers in the Republic of Panama and elsewhere throughout the Caribbean area. On April 1, 1946, hourly employees received an increase in their hourly rates which was designed to protect their take-home pay after they were placed on the 40-hour week.

Studies for the purpose of adjusting rates of pay of silver employees to conform with the generally increased cost of living were carried forward during the latter part of the fiscal year, and following the completion of these studies pay increases were authorized effective July 1, 1946.

SICK AND REST LEAVE

Under the present regulations alien employees, not otherwise entitled to vacation leave privileges, earn sick leave at the rate of 24 calendar days per year. A total of 20,624 sick-leave payments were authorized during the fiscal year 1946 as compared with 21,581 during the previous fiscal year. A total of 3,434 rest-leave payments were authorized in 1946 compared with 5,236 in the previous year.

CASH RELIEF FOR DISABLED SILVER EMPLOYEES

Applications for relief under the act of Congress of July 8, 1937, averaged 30 per month during the fiscal year 1946. The regulations established during the latter part of the fiscal year 1938 for administering this relief were continued without material change.

The table below shows the disposition of all applications from employees of both The Panama Canal and the Panama Railroad Company during the fiscal year 1946:

Applications	Panama Canal	Panama Railroad	Total
Applications on hand, July 1, 1945.....	26	3	29
Applications received during period.....	290	67	357
Total.....	316	70	386
Disposition:			
Applications approved for payment.....	183	52	235
Applications suspended for various reasons.....		1	1
Applicants died before relief approved.....	3		3
Applications rejected for various reasons.....	1		1
Applicants ineligible because of act's limitations.....	96	7	103
Applications not complete but in various stages of progress, June 30, 1946.....	33	10	43
Total.....	316	70	386

NOTE.—Removal from the rolls on account of the death or subsequent reemployment of cash relief recipients: The Panama Canal, 53; Panama Railroad Company, 20.

Total and average costs per month during the fiscal year 1946 were as follows—

	Number of cases	Monthly average payment per case	Monthly average payments
Panama Canal rolls.....	694	\$18.51	\$12,845
Panama Railroad Company rolls.....	262	18.06	4,732
Panama Railroad pensioners.....	¹ 91	¹ 14.21	¹ 1,293
Total.....	1,047	18.02	18,870

¹ Superannuated employees granted cash relief prior to July 8, 1937.

Expenditures on behalf of The Panama Canal cash-relief program are paid from annual appropriations for that purpose, while those of the Panama Railroad Company constitute a continuation of the former plan of granting cash relief to the superannuated employees of that company and are paid by the Panama Railroad Company.

REPATRIATIONS

In 1934 an appropriation of \$150,000 was provided for the repatriation and rehabilitation of alien former employees (and their families) who have rendered at least 3 years' service with the United States Government or the Panama Railroad Company on the Isthmus. During the fiscal year 1946, \$15,258 was expended for the repatriation and rehabilitation of 133 former employees, and 66 members of their families, a total of 199 persons. To date, a total of \$94,621 has been expended for repatriation and rehabilitation of 1,172 employees accompanied by 862 members of family, a grand total of 2,034 individuals. The average cost per person for repatriation and rehabilitation has been \$46.52, and the average cost per employee, \$80.73.

CENTRAL LABOR OFFICE

The central labor office program of The Panama Canal provides for eligibility control over applicants seeking employment with Government agencies and private contractors operating on Government work in the Canal Zone. A general decrease of employment activities is indicated by the comparative figures presented below, showing the total numbers of silver employees carried on the rolls of the various organizations as of June 1946 and June 1945, the decrease in total force being nearly 4 percent:

	June 1946	June 1945
Panama Canal and Panama Railroad Company.....	22,315	24,347
U. S. Army.....	12,577	10,922
U. S. Navy.....	5,165	5,516
Other Federal agencies.....	375	(¹)
Government contractors.....	1,169	663
Miscellaneous.....	228	1,915
Total.....	41,829	43,363

¹ Included with miscellaneous.

Because of the insufficient supply of qualified labor on the Isthmus to handle the heavy construction program carried on during the war emergency, The Panama Canal was forced to resort to the recruitment of contract laborers from the Republic of Colombia, Jamaica, Costa Rica, and El Salvador. With the cessation of hostilities and the resultant tapering off of construction for defense, there was no need for further recruitment of foreign labor.

From the inception of the foreign recruiting program in 1940, 22,265 contract workers have been brought to the Isthmus. Of this number, 19,317 have been repatriated, leaving as of June 30, 1946, a total of 2,948 still on the Isthmus. The following table shows figures for the different areas from which the workers were recruited:

	Number recruited	Number repatriated	Number remaining on Isthmus June 30, 1946
Colombia.....	2,244	2,156	88
Costa Rica.....	2,248	2,131	117
El Salvador.....	12,773	10,169	2,604
Jamaica.....	5,000	4,861	139
Total.....	22,265	19,317	2,948

WORK SIMPLIFICATION PROGRAM

During the latter part of the fiscal year 1946, a representative of the Division of Administrative Management of the Bureau of the Budget, Washington, D. C., was detailed to the Canal Zone at the request of the Governor to institute a work simplification program as set forth by the Bureau of the Budget.

The program was instituted on March 9, 1946. The representative of the Budget Bureau remained on the Isthmus 2 months super-

vising the starting of the work and the training of key Panama Canal personnel to whom the prosecution of the program was entrusted. At the close of the year the program was underway in several units of the Canal organization. This work will be carried on throughout the coming fiscal year and formally introduced to other departments.

SAFETY PROGRAM

A safety section in the Canal-Railroad organization was established on April 26, 1940. The principal duties of the safety section are to promote the application of safety measures in all subdivisions of The Panama Canal-Panama Railroad organization, and to develop and improve the programs of accident prevention for the organization as a whole. This is accomplished by various activities such as periodic inspections of field conditions, investigations of accidents, recommendations pertaining to safety matters, holding of safety committee meetings in various divisions of the organization, and development of interest among supervisory and other employees in the subject of accident prevention.

During the fiscal year 1945, because of an upward trend in the Canal-Railroad injury rate it was decided to enlarge and place greater emphasis on the safety program. Additional personnel were assigned to safety duty and a Panama Canal-Panama Railroad Safety Board was established on which all Department heads are represented, to review progress of the safety program, make recommendations and formulate and promulgate safety policies for reducing injuries and accidents. The effectiveness of this intensified safety program has been confirmed by the fact that there was a 30-percent reduction in the accident frequency rate this fiscal year as compared with that of the previous year.

The following statistics cover the accident rates for the Canal-Railroad organization for the 6 full fiscal years since institution of the safety program:

Year	Man-hours worked	Lost time injuries	Frequency rate ¹	Time charges	Severity rate ²	Fatalities
1941.....	72,725,000	5,750	79	214,170	2.94	21
1942.....	92,429,000	4,978	54	238,628	2.58	27
1943.....	94,325,000	3,585	38	230,914	2.45	28
1944.....	80,499,000	2,770	34	158,770	1.97	17
1945.....	70,108,000	2,347	33	90,159	1.29	6
1946.....	61,510,000	1,440	23	81,007	1.32	8

¹ Frequency rate is the lost time injuries per million man-hours worked.

² Severity rate is the time charges, in days, per thousand man-hours worked.

The slight rise in the severity rate over that of the preceding year was caused by the increase in the number of fatalities from six to eight. The number of injuries causing permanent partial disability was reduced from 26 for the previous year to 22 for this year.

The table below shows injury and death compensation benefits for the Canal-Railroad organization for each of the 6 years since the institution of the safety program, compared to the annual average for the preceding 23 years:

Yearly average	Injury compensation	Compensation per \$1,000 pay roll
23 years, 1918-40	\$51,886	\$3.31
Fiscal year:		
1941	86,290	2.55
1942	98,830	2.21
1943	104,550	2.17
1944	120,037	2.58
1945	107,585	2.56
1946	109,688	2.78

Approximately 75 percent of the compensation payments currently paid from month to month cover accidents that occurred in previous fiscal years and so the amount of such payments will not decrease during the next few years in proportion to the progress made in the prevention of accidents. Accordingly, because of the recent period of expanded activity the aggregate annual payments and rates may be expected to be high for the next several years but these payments would have been materially higher had it not been for the great improvement in accident prevention evidenced by the data shown above.

A sharp uptrend of vehicle accidents resulted in active promotion by the safety board of a change and improvement in traffic regulations and requirements for driver's licenses. A study of this matter is now being conducted by the executive secretary, general counsel, and police section.

EXPERIMENT GARDENS

The Canal Zone plant introduction gardens and experimental station were established in June 1923. The gardens, which include greenhouses, nurseries, and experimental plantings, embrace approximately 125 acres of land, and are devoted to the propagation and cultivation of a wide variety of useful and ornamental plants from all parts of the world, primarily for the purpose of determining their adaptability and value under local soil and climatic conditions, for general propagation on the Isthmus. This unit also designs and supervises all landscape work for The Panama Canal and the Panama Railroad Company. In order to help meet the demand for fresh vegetables, the gardens maintain a small, self-supporting vegetable garden.

The landscape section handled a total of 98 projects, the majority of which were for The Panama Canal.

CLUBHOUSES

The Panama Canal clubhouses, which are operated on a self-supporting basis, comprise activities designed to provide restaurant, motion picture, bowling and other facilities at reasonable rates to Government personnel, their families and guests. These activities, particularly the restaurants, were considerably expanded during the war years when the business transacted was some six or seven times higher than the prewar level. The cessation of hostilities and the subsequent reduction of civilian and military personnel on the Isthmus resulted in a decline in all of these activities.

During the year the clubhouse bakery on the Atlantic side of the Isthmus, formerly operated under the supervision of the clubhouse manager, was placed under the management of an experienced baker as a separate operating unit, resulting in a greater variety and better quality of bakery goods for clubhouse patrons. Alterations and improvements to the Balboa clubhouse kitchen, cafeteria, etc., begun in the fiscal year 1945, were substantially completed at the end of the fiscal year 1946. A new soda luncheonette section was installed and placed in service at the Cristobal Gold Clubhouse.

LEGISLATION

Among the laws enacted by the Congress during the fiscal year 1946 which relate to or apply in the Canal Zone or affect The Panama Canal and which are of importance and interest are those described below:

An act approved December 6, 1945, providing for the financial control of Government corporations (Government Corporation Control Act).

An act approved December 28, 1945, authorizing an investigation of means of increasing the capacity and security of the Panama Canal.

An act approved April 16, 1946, extending the privilege of retirement to certain judges, including the judge of the United States District Court for the District of the Canal Zone.

Legislation relating to the Canal Zone introduced during the fiscal year 1946 and still pending in Congress includes:

Two bills (H. R. 3748 and H. R. 6160) to extend the benefits of the act of May 29, 1944, providing for the recognition of the services of civilian officials and employees engaged in and about the construction of the Panama Canal.

A bill (H. R. 4148) to amend section 339 of the Nationality Act of 1940 so as to provide for the issuance of certificates of citizenship to persons claiming United States citizenship under the provisions of section 203 relating to birth in the Canal Zone or Republic of Panama.

A bill (H. R. 4321) to amend the Canal Zone Retirement Act with respect to the taxation of retirement annuities paid to certain employees of The Panama Canal and the Panama Railroad Company.

An omnibus bill (H. R. 5402) to amend the Canal Zone Code in reference to several varied and, for the most part, unrelated subjects.

An omnibus bill (H. R. 5587) to amend the Canal Zone Code in several respects, principally for the purpose of enacting substantive law in support of certain appropriation act provisions.

A bill (H. R. 6372) which would extend the Federal Credit Union Act to the Canal Zone.

A bill (H. R. 6813) to amend the Canal Zone Retirement Act so as to make retroactive the provisions of the act of July 29, 1942, providing an additional minimum method of computation of retirement annuities.

A bill (H. R. 6814) to amend the Canal Zone Retirement Act so as to provide for optional retirement on full annuity after 25 years of service regardless of age or length of service on the Isthmus.

CAPITAL ALLOTMENTS, FISCAL YEAR 1947

The appropriations for 1947 carried \$4,504,381 for improvements and betterments and for the replacement of worn-out or excessively deteriorated facilities as follows:

Expansion of water system, Pacific side.....	\$2, 169, 000
Road and street replacements.....	497, 000
Six additional towing locomotives for Locks.....	455, 000
Occupational high schools for alien colored children, La Boca and Silver City.....	369, 000
Construction of silver quarters.....	276, 000
Steam plant and distribution lines, Gorgas Hospital.....	247, 000
Pattern stowage building, mechanical division, Balboa.....	157, 600
Addition to white elementary school, Gamboa.....	56, 500
Paint shop improvements, Balboa.....	52, 000
Toilet and locker facilities, Pedro Miguel locks.....	48, 300
Additional nurses quarters, Corozal Hospital.....	46, 981
Road improvements, Mount Hope cemetery.....	30, 000
Miscellaneous minor improvements.....	100, 000
Total.....	4, 504, 381

Brief comment on these projects is given below:

Expansion of water system, Pacific side.—The appropriation of \$2,169,000 was made to defray the cost of the first part of a 2-year expansion project designed to make available additional water supplies for the Republic of Panama, the Army and Navy, and The Panama Canal on the Pacific side. The principal increase in demand in the near future is expected to come from the Republic of Panama.

Road and street replacement.—This appropriation is to cover the second part of a 6-year program to modernize the narrow and deteriorated streets and roads of the Canal Zone. The majority of these streets and roads were built to the standards of the period of 1914 and 1924 and are at present not suited for the weight, volume and greater speed of the traffic using them. The heavy traffic to which these streets have been subjected, particularly during the war emergency, has greatly accelerated their deterioration and increased the cost of maintenance.

Six additional towing locomotives for locks.—The addition of these six locomotives for the locks will enable the necessary towing service to be maintained and at the same time permit the overhaul and repairs of the present equipment which has been subjected to severe service in the past few years.

Occupational high schools for alien colored children, La Boca and Silver City.—This appropriation is to cover the cost of construction of two 3-year occupational high schools, one at La Boca on the Pacific side and one at Silver City on the Atlantic side, for the children of the aliens who reside in the Canal Zone and are employed on the silver roll. The operation of these occupational high schools will provide training courses to prepare the children for efficient service in certain occupational groups in which large numbers are employed on the Canal Zone.

Construction of silver quarters.—The construction of silver quarters in 1947 initiates a program of replacement of existing unsatisfactory family housing for permanently employed aliens on the silver roll. As erected, these new quarters will replace the old frame buildings now

used for silver living quarters. Dating from the construction period of the Canal, many of these buildings were originally erected as temporary buildings, but have been kept in service because of the pressing need for housing. The appropriation provides for the construction of 27 individual buildings, containing 66 apartments.

Steam plant and distribution lines, Gorgas Hospital.—This appropriation is to defray the cost of a new steam plant and distribution lines with sufficient capacity to provide steam and hot water in sufficient quantity and at proper temperature at all points in the hospital.

Pattern stowage building, mechanical division, Balboa.—The new pattern stowage building, mechanical division, Balboa, will provide sufficient space to store and preserve all patterns now on hand, and insure space for patterns which may be acquired. The present building is beyond economical repair and, furthermore, is too small for proper stowage of the 21,000 patterns now on hand.

Addition to white elementary school, Gamboa.—The present elementary school has become too small to accommodate properly the number of children of elementary school age now residing in Gamboa. To relieve this overcrowded condition and to provide adequate facilities for future increased enrollment, an addition of four rooms is to be made to the present building.

Paint shop improvements, Balboa.—The location of the present paint shop facilities in the building division area is such that it presents a constant fire hazard to other facilities in the area. This appropriation provides for the removal of the paint shop to an area at some distance from the other building division activities which would be endangered in case of fire.

Toilet and locker facilities, Pedro Miguel locks.—The existing facilities are housed in a temporary wooden structure, which is neither accessible to all locks employees, nor adequate for the requirements. The appropriation will cover the cost of constructing a combined store-room, locker room, and toilet room on the west wall of the locks; a toilet building at the north end of the east side wall, and a toilet building at the north end of the west side wall.

Additional nurses' quarters, Corozal Hospital.—The existing nurses' quarters at Corozal Hospital have become inadequate for the proper housing of nursing personnel stationed there. To remedy this condition it is proposed to construct a new building containing 8 apartments which, when completed, will provide sufficient quarters to meet the present needs and the anticipated increased requirements of the future.

Road improvements, Mount Hope Cemetery.—These improvements will consist of repaving, widening, and otherwise improving the roads in the Mount Hope Cemetery. The existing roads are over 30 years old, lightly constructed of asphalt macadam, and were originally laid for horse-drawn vehicles.

Miscellaneous minor improvements.—The funds provided under this category will permit construction during the year of improvements of a minor nature, the need for which may arise from time to time and which could not be foreseen when the budget was prepared.

BUDGET ADMINISTRATION

Effective with the 1947 estimates of appropriations a revised functional classification of the budgetary presentation for The Panama Canal was adopted. In the revised presentation individual functional classifications have been provided for a number of operations formerly listed under one general heading while other operating subsections have been consolidated with related units.

One of the major revisions in classification occurred with respect to appropriation for the executive office listed under maintenance and operation appropriation. Of the activities in this group the following were set up as separate functions in the budgetary presentation, under maintenance and operation appropriation: Office of the Governor, office of the engineer of maintenance, office of the assistant engineer of maintenance, office of the general counsel, personnel administration, general correspondence and records, and the air terminal. The office of the executive secretary and the library unit were likewise set up as distinct functions but were transferred to civil government appropriation. The remaining functions under the old executive office classification were transferred to civil government appropriation: the civil intelligence section being grouped with the police section, and the shipping commissioner with civil affairs. Another change in classification under maintenance and operation appropriation includes the grouping of various functions under the classification of highways, so as to bring together in the budget presentation the related sub-functions of roads and streets, street lighting, ferry service, and bridges.

The revised classification provides a more comprehensive budget presentation and is designed to facilitate the examination of the estimates of appropriations in the Bureau of the Budget.

SECTION IV

GOVERNMENT

The civil government of the Canal Zone is conducted as prescribed in the Panama Canal Act of August 24, 1912, and subsequent acts and Executive orders applicable to the Canal Zone. Whenever practicable, governmental functions have been assigned to departments in the organization established for the operation and maintenance of the Canal. Complete cooperation and increased efficiency are derived from such coordination of functions.

Data on expenses and revenues of various features of Canal operation and government are contained in the financial and statistical statement in section V of this report.

AREA OF THE CANAL ZONE

The total area of the Canal Zone,¹ with areas segregated for various purposes, is shown as of June 30, 1946:

LAND AREA		Square miles
Military and naval reservations (inclusive of revocable license areas):		
Military reservations.....	88. 24	
Naval reservations.....	12. 03	
Total.....		100. 27
Canal Zone townsites and areas in active use.....		16. 39
Miscellaneous assigned land areas:		
Barro Colorado Island.....	5. 71	
Forest preserve.....	5. 47	
Cattle pastures.....	41. 80	
Commercial leases.....	. 23	
Third locks project.....	. 72	
Total.....		53. 93
Remaining usable land.....		176. 43
Swamps.....		15. 16
Total land area of the Canal Zone.....		362. 18
Water area (inclusive of Madden Lake to the +260-foot contour).....		190. 94
Total area of the Canal Zone.....		553. 12

POPULATION

By compiling information obtained from the chief quartermaster, the land section, the Army and Navy authorities, and by making a house-to-house canvass of persons employed by commercial interests, in March 1946 an estimate was made of the population of the Canal Zone. The estimated population figures include civilian employees of

¹ Not inclusive of noncontiguous areas, with the exception of Paitilla Point Military Reservation.

the Army and Navy, and members of the families of Army and Navy personnel, but omit commissioned, warrant, and enlisted personnel of the armed forces.

In previous years the population figures were secured by making a house-to-house canvass of the entire population of the Canal Zone with the exception of that of Army and Navy reservations, the latter information being furnished by the Army and Navy authorities.

The following is a summary of the population by districts:

	Americans			All others			Total
	Men	Women	Children	Men	Women	Children	
Balboa district.....	5, 446	5, 595	4, 402	8, 284	2, 981	5, 606	32, 314
Cristobal district.....	1, 435	1, 487	1, 255	4, 569	2, 190	5, 102	16, 038
Total 1946.....	6, 881	7, 082	5, 657	12, 853	5, 171	10, 708	48, 352
Total 1945.....	7, 150	5, 937	4, 040	13, 176	6, 398	7, 987	44, 688
Total 1944.....	8, 251	5, 771	3, 710	16, 073	6, 466	7, 504	47, 775

The population as of March 1946 was 8.2 percent higher than in 1945. The Canal Zone population has been at abnormally high levels during the past 6 years because of the large number of persons brought to the Isthmus to work on construction projects of the Army, Navy, and Panama Canal. The peak civilian population of the wartime period occurred in 1943 when the total reached 59,370, which was about double the 1938 population.

After the end of hostilities, members of families of service personnel were permitted to come to the Isthmus, with the result that there was a marked increase in the number of American women and children as reflected in the table above. A substantial increase also occurred in the number of children of other nationalities.

In addition to the population figures shown above, the records showed that in March 1946 there were 1,563 Americans (488 men, 536 women, and 539 children) residing in United States Government quarters in New Cristobal, Republic of Panama.

PUBLIC HEALTH

The health of the Canal Zone populace remained relatively good during the year. Excluding malaria and venereal diseases, the average number of reportable diseases per month for the year was 64, as compared with 57 per month during the previous fiscal year, 125 per month for the fiscal year 1944, and 115 per month for the fiscal year 1943.

The malarial rate for employees of the Panama Canal and the Panama Railroad Company continued to be relatively low. The rate for the 6-month period January through June 1946 was 15.2, in comparison with rates of 11.6 and 12.7 during similar periods in 1945 and 1944.

VITAL STATISTICS

The morbidity and mortality rates from diseases and injuries together with other vital statistics relating to the population of the Canal Zone and the cities of Panama and Colon, are set forth in detail

in the report of the Health Department for the calendar year, which is published annually in booklet form. For this reason, the data herein pertaining to vital statistics are limited to a brief résumé of the most important information.

General death rates.—Death rates in the Canal Zone, Panama City, and Colon have declined appreciably in the past 5 years. The rate for the Canal Zone is artificially low in comparison with Panama City and Colon, because employees generally leave the Isthmus after retirement. Below are shown death rates by yearly periods for the past 5 calendar years:

Death rate per 1,000 population, all causes

	Calendar year				
	1945	1944	1943	1942	1941
Canal Zone ¹	5.12	6.13	6.24	6.24	8.75
Panama City.....	9.42	10.57	10.49	10.62	11.43
Colon.....	12.32	11.55	12.11	12.13	15.00

¹ Omits Army and Navy personnel.

Principal causes of death.—The principal causes of death in each of the groups of population were as follows:

Number of deaths and annual rate per 1,000 population, calendar year 1945

	Canal Zone		Panama City		Colon	
	Number	Rate per 1,000	Number	Rate per 1,000	Number	Rate per 1,000
Cancer of various organs.....	29	0.65	101	0.81	47	1.00
Organic diseases of the heart.....	29	.65	100	.80	33	.70
Diseases of the arteries ¹	20	.45	37	.30	27	.57
Diarrhea and enteritis.....	18	.40	92	.74	60	1.28
Apoplexy.....	12	.27	51	.41	24	.51
Tuberculosis.....	10	.22	211	1.69	73	1.55
Nephritis (acute and chronic).....	10	.22	55	.44	45	.96
Syphilis.....	10	.22	36	.29	18	.38
Pneumonia.....	7	.16	108	.86	36	.77

¹ Includes following deaths due to diseases of the coronary arteries and angina pectoris: Canal Zone, 14, Panama City, 23; Colon, 15.

Birth rate.—In the Canal Zone a change in the birth rate, as distinct from the number of births, has only limited significance because of the peculiar situation which exists with regard to the population on which the rate is calculated. For the past 5 years, the rate has been based on population figures which exclude uniformed personnel of the Army and Navy, as distinct from members of their families, although children born to Army and Navy families are included in the total number on which the rate is calculated.

A further point to consider concerns the population of silver families in the Canal Zone, inasmuch as Canal Zone quarters are generally

available only to silver employees who have more than average length of service and who are therefore in the older age brackets. The fact that the population of the Canal Zone includes a large number of contract laborers without their families is another factor which obviously tends to distort the birth rate.

The following table shows for the past 5 years the birth rates in the Canal Zone and the terminal cities of Panama and Colon:

Birth rate per 1,000 population

	Calendar year				
	1945	1944	1943	1942	1941
Canal Zone:					
White.....	32.23	32.65	27.21	23.08	24.75
Colored.....	18.47	19.07	15.25	13.07	15.80
Combined.....	23.74	24.11	19.48	16.65	19.10
Panama City.....	32.62	34.03	34.06	30.38	29.60
Colon.....	38.81	37.45	34.32	27.38	27.20

NOTE.—Population base for Canal Zone excludes Army and Navy personnel.

Death rates among children under 1 year of age.—The following table shows the infant mortality rates per 1,000 births for the past 5 years:

Deaths of infants under 1 year of age per 1,000 live births

	Calendar year				
	1945	1944	1943	1942	1941
Canal Zone:					
White.....	24	17	24	22	51
Colored.....	44	43	51	53	61
Combined.....	34	30	38	38	56
Panama City.....	72	70	73	79	89
Colon.....	94	84	65	79	97

MALARIA

The rates for malaria among employees only for the past 10 years are shown below:

Calendar year	Rate per thousand	Calendar year	Rate per thousand
1936.....	12	1941.....	14
1937.....	12	1942.....	25
1938.....	10	1943.....	15
1939.....	14	1944.....	13
1940.....	17	1945.....	13

There was one death from malaria among employees during the calendar year 1945.

HOSPITALS

The number of patient days in Panama Canal hospitals for the past three fiscal years was as follows:

	Fiscal year		
	1946	1945	1944
Gorgas Hospital.....	273, 183	337, 683	365, 429
Corozal Hospital:			
Insane.....	90, 838	94, 621	98, 198
Cripples and chronic medical and surgical cases.....	35, 066	35, 317	36, 029
Colon Hospital.....	51, 842	53, 109	47, 048
Margarita Hospital.....	27, 021	28, 406	22, 348
Palo Seco Leper Colony.....	42, 765	43, 159	42, 426
Total.....	520, 715	592, 295	611, 478

QUARANTINE AND IMMIGRATION

During the fiscal year 1946, inspection was made of 6,868 ships and 4,303 airplanes, as compared with 5,190 vessels and 3,512 airplanes during the fiscal year 1945. Passenger traffic on arriving vessels and airplanes likewise increased over the previous year.

One case of alastrim and one case of typhus were reported on arriving vessels. Each case was isolated in Gorgas Hospital and the ships detained under quarantine until appropriate quarantine measures were accomplished. Neither case was fatal and no additional cases developed.

Constant vigilance is necessary to prevent the entry of plague, typhus, and jungle fever into the Canal Zone. During the fiscal year 1946, 18 percent of all passengers (10,028) arriving in the Canal Zone by airplane were vaccinated for smallpox; many of these passengers had never received a previous vaccination.

The following is a summary of transactions for the fiscal year 1946, together with the figures for the 2 preceding fiscal years:

	Fiscal year		
	1946	1945	1944
Vessels inspected and passed.....	6, 868	5, 190	3, 568
Vessels granted pratique by radio.....	50		
Total.....	6, 918	5, 190	3, 568
Crew passed by quarantine.....	340, 941	288, 503	184, 946
Crew passed by radio.....	2, 140		
Passengers passed at quarantine.....	172, 556	65, 322	53, 134
Passengers passed by radio.....			
Total.....	515, 637	353, 825	238, 080
Airplanes inspected and passed.....	4, 303	3, 512	2, 656
Crew of airplanes inspected and passed.....	17, 276	13, 487	11, 345
Passengers of airplanes inspected and passed.....	57, 080	47, 473	36, 912
Total.....	74, 356	60, 960	48, 257
Vessels detained in quarantine.....	3	2	3
Crew detained in quarantine on board ship.....	181	412	175
Passengers detained in quarantine on board ship.....	2, 148	744	55
Passengers admitted to station on account of quarantine laws.....			
Number of detention days at station on account of quarantine laws.....	4, 636	5, 455	2, 946
Immigration cases admitted to station.....	35, 441	40, 156	35, 399
Number of immigration detention days.....	83	124	114
Persons held for investigation and released.....	5, 227	3, 831	3, 533
Persons deported under immigration laws.....	6, 101	6, 128	4, 695
Supplementary sanitary inspection of vessels.....	108	175	107
Vessels fumigated.....			

MUNICIPAL ENGINEERING

Municipal work carried on during the year included the construction and maintenance of roads, streets, and sidewalks, and the operation and maintenance of the water and sewer systems in the Canal Zone. The furnishing of filtered water and the maintenance of the water systems and the streets in the cities of Panama and Colon, Republic of Panama, also were handled by the municipal engineering division. Construction work was performed for departments and divisions of The Panama Canal, the Army and Navy, the Government of the Republic of Panama, and for individuals and companies. Only the major items of this work are commented upon in this report.

WATER SYSTEM

Consumption of water for municipal uses and for sales to vessels during the past 3 fiscal years was as follows:

[Thousands of gallons]

	Fiscal year		
	1946	1945	1944
Canal Zone.....	7,497,466	7,822,367	7,919,237
City of Panama.....	3,556,796	3,181,981	2,909,916
City of Colon.....	1,302,426	1,307,372	1,388,098
Sales to vessels.....	361,685	364,165	230,744
Total.....	12,718,373	12,675,885	12,447,995

In addition to the regular maintenance work performed on the pipe lines, reservoirs, filtration plants, and pumping stations, several special projects were completed on the water system. The most important of these was the cleaning and cement-lining under private contract of 39,154 lineal feet of 30-inch and 18,818 lineal feet of 36-inch cast iron raw water main between Gamboa pump station and the Miraflores filtration plant. Previous to this work the main was capable of delivering to the filtration plant only 10,800 gallons per minute by gravity from the surge tank at Summit; after its completion a flow of 16,500 gallons per minute was obtained under the same conditions, representing an increase in capacity of about 52 percent. Cleaning also was accomplished of the 20- and 30-inch filtered water gravity mains from Miraflores to Balboa.

Work was completed during the year on the installation of a 20-inch pumping main from Ancon postoffice to a point west of section E, Gorgas Hospital, a distance of 3,920 feet. The purpose of this project was to replace the old and poorly located 20-inch main with cement-lined pipe and to increase water supply to Panama City.

The installation of 15,000 feet of 30-inch cast-iron cement-lined pipe from Paraiso raw water pump station to the Miraflores filter plant, with a cross connection between the existing 30-inch line at the Paraiso Wye, was completed in January 1946. This was a carry-over from the previous year of a project which was started in January 1945.

Work was started in November 1945 on a general survey of the water system. The permanent water system maps are being brought up to date, all valves are being inspected and given necessary repairs and maintenance, and the information indexed. Leaks amounting to several million gallons per month were located and repaired.

SEWER SYSTEM

In addition to the regular maintenance work performed on the Canal Zone sewer system, the work started in the previous year on the repair of existing concrete box sewers in the Balboa area was completed during the fiscal year 1946.

ROADS, STREETS, SIDEWALKS—CANAL ZONE

Regular maintenance work was performed on the roads, streets, and sidewalks during the year. In addition to this ordinary maintenance work, a number of special projects were carried on during the year. The more important of these included the completion of paving and other improvements to Balboa Road, between Roosevelt Avenue and Pier Street, and paving and other municipal work on two sections of Frangipani Street, Ancon. Work was 85 percent complete at the end of the year on the repaving and other improvements to Roosevelt Avenue, between Corozo Street and Thatcher Street, Balboa.

Another project started during the year included the reconstruction of Tivoli Avenue and Fourth of July Avenue. This project covers the rebuilding of Tivoli Avenue from Shaler Road to Gorgas Road and the reconstruction of Fourth of July Avenue from Gorgas Road to Balboa Road. All of the old macadam and asphalt pavement will be replaced with 8-inch reinforced concrete and other improvements will be made as necessary. The work on the first section of Tivoli Avenue, from Shaler Road to Ancon Boulevard, was 10 percent complete at the end of the fiscal year 1946.

OTHER HEAVY CONSTRUCTION ACTIVITIES

Dredging Division Dock, Diablo Heights.—This project was started in October 1944, and was commented upon in the Governor's annual report for 1945. As originally designed, the main section of the dock was to consist of a deck 50 feet wide by 494 feet long, supported on 14 bents which, in turn, are founded on piles drilled into rock bottom of the Canal. In addition, there is an approach trestle 21 feet wide by 260 feet long, supported on 13 bents of piles. In February 1946 the construction program was revised, reducing the length of the main dock to 429 feet; no change was made in the approach trestle. A total of 1,527 lineal feet of piles were set in 1946, completing a total of 4,174 feet. Other principal items of work accomplished during 1946 included the placing of 26 precast 6-foot square reinforced concrete caisson shells and 13 prefabricated collapsible base forms; pouring of 3,377 cubic yards of concrete, and the installation of 1,080 lineal feet of pipe work and 7,500 pounds of metal work. The dock was 82 percent complete at the end of the year.

Ferry slip repairs, Balboa.—This project covered repairs to both the east and west ferry slips at Balboa. A total of 65 piles, varying in length from 70 to 90 feet, were driven at the west ferry slip and eight 70-foot piles at the east slip. A total of 68,000 board feet of creosoted timbers 12- by 12-inch, 12- by 16-inch, and 8- by 16-inch, were used in wales and framing.

Repairs to Albrook Field runway.—The purpose of the project was to restore the surface of the runway to a suitable grade. This was

accomplished by filling the sags with asphaltic concrete to bring them to a grade to produce a smooth riding surface. A total of 693,560 pounds of road asphalt, 30,488 gallons of cutback asphalt, 707 tons of asphalt mix and 5,000 cubic yards of rock were used in repairing 52,000 square yards of surface.

CITIES OF PANAMA AND COLON

Regular maintenance work was performed on the water and sewer systems during the year. Several improvement projects also were carried on during the year, the most important of which covered the paving and other improvements to Avenida Balboa from Calle 30 to Calle 3 de Noviembre, Panama City. Work on this project, which was started in the previous year, was carried forward during 1946 and at the end of the year was 90 percent complete, the final work being held in abeyance pending the removal of the buildings at the intersection of Calle 3 de Noviembre and Avenida Balboa. Other important items included various municipal improvements to the area between Calle 11 and Calle 12 and between Avenida Melendez and Gorgas Drive, Colon; and the installation of 18,600 feet of 16-inch water line from Corozal bridge to Pueblo Nuevo.

MISCELLANEOUS ACTIVITIES

Sosa Hill Quarry and rock crushing plant.—Rock crushed during the fiscal year 1946 and sold to various departments and divisions of The Panama Canal, Panama Railroad Company, the United States Army, the United States Navy, the Republic of Panama, and to individuals and companies, totaled 94,345 cubic yards. This plant also produced 14,085 tons of asphaltic mixtures for resurfacing old roads and for the construction of new roads and streets.

Central Mixing Plant.—During the year 24,819 cubic yards of ready-mixed concrete were produced and sold.

PUBLIC ORDER

During the fiscal year 8,722 persons were arrested, an increase of approximately 13 percent as compared with the previous year. Statistics covering these arrests, with corresponding figures for the previous year, are given in the following table:

	Fiscal year	
	1946	1945
Male.....	8,192	7,314
Female.....	530	421
Total.....	8,722	7,735
Arrests made with warrants.....	1,058	932
Arrests made without warrants.....	7,664	6,803
Total.....	8,722	7,735
Residents of the Canal Zone.....	2,634	2,308
Residents of Panama.....	5,344	4,878
Transients.....	744	549
Total.....	8,722	7,735

There were 9,387 charges filed against persons arrested during the fiscal year 1946, of which 9,075 were misdemeanors and 312 were felonies, the latter being 3.3 percent of the total offenses charged. The following were the principal causes of arrest:

Cause of arrest	Fiscal year	
	1946	1945
Violation of vehicle traffic regulations.....	4, 820	4, 145
Loitering.....	788	532
Trespassing.....	544	277
Petit larceny.....	521	399
Intoxication.....	491	351
Disturbing the peace.....	311	296
Battery.....	294	296
Fugitive from justice.....	254	197
Vagrancy.....	215	109
Enemy alien entering Canal Zone.....	3	3
Violation of Trading With Enemy Act.....	2	2
All others.....	1, 146	1, 682
Total.....	9, 387	8, 289

Homicides.—Five cases of homicide were investigated by the coroner during the year, one of which was the result of a motor vehicle accident, three the result of gun fire, and one the result of stabbing. The motor vehicle accident resulted in the death of a Canal Zone patrol officer whose motorcycle was struck by another vehicle.

Suicides and other investigations by the coroner.—The coroner investigated four cases of suicide during the past year, two of which were by drowning, one by the use of firearms, and one by the use of a knife. Coroner's investigations were made in a total of 79 cases of deaths during the year, of which 22 were from natural causes, 12 from accidental drowning, 10 from vehicle injuries, and the remainder from other causes.

Prisoners.—During the year the number of prisoners serving sentences in the Canal Zone jails averaged 93.5 per day. All physically able prisoners were employed on useful work.

Seventy-four convicts were committed to the Canal Zone penitentiary, an increase of seven as compared with the preceding year. Sentences imposed on these convicts totaled 194 years and 9 months. Sixty-four convicts were discharged, leaving 101 in custody at the end of the year. Computed at standard rates of pay for common labor the value of the labor performed by convicts during the year amounted to \$41,182. Of this amount, 24 percent represented the value of work performed in the operation, maintenance, and improvement of the penitentiary buildings and grounds; 60 percent on the penitentiary farm; and the remaining 16 percent on outside municipal work.

Deportations.—By order of the Governor, 32 persons were deported from the Canal Zone during the fiscal year, of whom 22 were convicts who had served sentences in the penitentiary and 10 were persons whose continued residence in the Canal Zone was regarded as undesirable.

TRAFFIC ACCIDENTS AND CONTROL

There were 770 traffic accidents reported during the year, or an average of 64 per month, compared with an average of 53 per month during the previous year. These accidents resulted in the deaths of 12 persons and injuries to 426 other persons. Following is a classification of the causes of these accidents for the past 3 fiscal years:

Cause	Fiscal year		
	1946	1945	1944
Negligent driving.....	516	404	468
Reckless driving.....	71	92	127
Careless pedestrian.....	62	47	70
Intoxicated driver.....	33	29	35
Defective vehicle.....	28	24	18
Careless passengers.....	9	4	12
Inexperienced driver.....	8	9	11
All others.....	43	29	23
Total.....	770	638	764

MAGISTRATES' COURTS

The following is a summary of business transacted at the magistrates' courts for the subdivisions of Cristobal and Balboa for the fiscal year 1946, together with comparative figures for the fiscal year 1945:

	Cristobal		Balboa		Total	
	1946	1945	1946	1945	1946	1945
Cases handled:						
Criminal.....	3,058	2,384	5,488	5,091	8,546	7,475
Civil.....	12	14	19	10	31	24
Total.....	3,070	2,398	5,507	5,101	8,577	7,499
Disposition of criminal cases:						
Conviction.....	2,827	2,171	5,085	4,704	7,912	6,875
Acquittal.....	98	79	178	172	276	251
Dismissal.....	102	54	96	87	198	141
Held for district court.....	61	80	125	128	186	208
Total.....	3,088	2,384	5,484	5,091	8,572	7,475
Convictions in which execution of sentences was suspended and defendants placed on probation.....	70	95	174	120	244	215
Rearrested for violating terms of probation.....	13	10	10	7	23	17
Revenues.....	\$25,508	\$21,042	\$30,361	\$27,855	\$55,869	\$48,897

PARDONS AND REPRIEVES

The pardon board, consisting of five members appointed by the Governor, acts in an advisory capacity in the consideration of requests submitted by prisoners for executive clemency. During the past year the board submitted recommendations to the Governor on 37 applications for executive clemency, 33 of which were for commutation of penitentiary and jail sentences, 1 for a full pardon, and 3 for revocation of orders of deportation following service of sentences of imprisonment. The Governor extended clemency in 10 of these cases.

On June 4, 1946, Mr. Patrick S. Coakley was appointed to the pardon board, replacing Mr. Oliver Bullock, whose retirement from the Panama Canal service became effective May 31, 1946.

FIRE PROTECTION

During the past fiscal year three emergency fire substations were closed and their personnel transferred elsewhere for duty.

During the year 336 fires, 65 false alarms, and 14 emergency calls were reported. The following table classifies the owners who suffered property losses during the year, as compared with the previous year:

	Fiscal year 1946		Fiscal year 1945	
	Number of fires	Property loss	Number of fires	Property loss
The Panama Canal.....	214	\$18,646	256	\$44,479
Panama Railroad Company.....	40	602	23	94
U. S. Army.....	23	126,057	12	1,110
U. S. Navy.....	12	86,105	10	40
Private (including ships).....	47	259,140	36	21,567
Total.....	336	490,550	337	67,290
Total property involved.....		\$14,675,769		\$7,465,273

Two serious fires occurred during the year—one on March 1, 1946, in the Masonic Temple building in Cristobal, and the other on April 13, 1946, in a two-story residence at Balboa Heights.

The Masonic Temple building fire originated in a film trimming room operated by a film-distributing company occupying rooms on the main floor of the building. The flames spread so rapidly that two men who were on the fourth floor when the fire began received burns which required their hospitalization. Twelve firemen also were hospitalized subsequent to the fire due to the inhalation of toxic gases generated by burning motion picture film. Several explosions occurred during the fire when gases entered the film storage vault through the ventilating system. The damage was estimated at \$224,684.

The residential fire at Balboa Heights originated in a dry locker in one of the two apartments of the building. The flames spread rapidly to the remainder of the apartment due to the fact that about 6 hours prior to the fire the entire dwelling had been sprayed with a disinfectant consisting of approximately 95 percent kerosene. The estimated loss by The Panama Canal was \$14,373 and private loss was estimated at \$2,000.

PUBLIC SCHOOL SYSTEM

The public school system for white children includes eight kindergartens; nine elementary schools, grades 1 through 6; two junior high schools, grades 7 and 8; two senior high schools, grades 9 through 12; an apprentice school; and a junior college. Public schools for colored children include six kindergartens; eight elementary schools, grades 1 through 6; five 3-year junior high schools, grades 7 through 9; and a 4-year normal training school.

The schools for white children operate on a 9-month basis and February enrollments are used for purposes of comparison, since they usually represent the enrollment peaks. In February 1946, 3,357 pupils were enrolled in the white elementary and secondary schools, as compared with 3,006 in February 1945. The white kindergarten enrollments were 281 in February 1946, as compared with 218 in February 1945.

For the past 3 years the average daily attendance has been as follows:

	Fiscal year		
	1946	1945	1944
White schools (see note).....	3, 130	2, 881	2, 624
Colored schools.....	2, 626	2, 805	2, 748

NOTE.—Junior college and kindergartens not included.

There was an increase in the enrollments in the Canal Zone Junior College over those of the preceding year. The February enrollments of regular and special daytime students numbered 89, compared with 60 in February of the previous year. While initial enrollments in October 1945 in the extension division of the junior college (which are in addition to those of regular and special daytime students) were only 232 as compared with 391 in October of the previous year, the February 1946 enrollment of 217 nearly equaled that of February 1945 when it was 225. It is anticipated that the reduction in tuition fees scheduled for the school year 1946-47 will result in an increased enrollment. The admission of students desiring to attend college under the provisions of the Servicemen's Readjustment Act of 1944 should also stimulate enrollments.

The apprentice-learner school was closed during the past year because of the great reduction in enrollment due to wartime factors; however, some apprentice-school work was carried on in night-school classes. It is expected that the apprentice school will be reopened in October 1946.

During the school year the white schools, not including the apprentice school, were in session 178 days and the colored schools 214 days. At the close of school in June 1946, 140 white teachers, including 7 junior college instructors, and 106 colored teachers were in regular employment in these schools.

Canal Zone white children continued to achieve above and colored children below United States norms provided for the standard tests used in the schools. On the basis of standard achievement tests administered, the average grade-8 white pupil was 1 school year and 6 months above, and the average colored pupil was 1 year below the United States norms.

In the white high schools the median pupil scored at the seventy-third percentile on United States norms provided for the tests, whereas in 1945 the median Canal Zone white high-school pupil scored on the sixty-seventh percentile.

A comparative study in methods of teaching Spanish was completed during the year. This plan involved the teaching by two different methods of two groups, matched in previous Spanish achievement, intelligence, and sex. One group was taught by regular classroom procedure and the other by means of commercial recordings. The results of this experiment showed no significant superiority for either method at the end of a year's study. Achievement in the study of United States history and trigonometry had not been satisfactory during the past, but considerable improvement in both of these sub-

jects was made as shown by the standard tests given during the year. Additional study will be carried on in an attempt to improve student achievement in United States history.

In accordance with the planned expansion of the education now offered to Canal Zone colored children, two occupational high schools are to be constructed during 1946-47, one in La Boca on the Pacific side of the Isthmus, and one at Silver City on the Atlantic side. With the completion of the buildings it will be possible to extend the period of schooling for colored children from 9 to 12 years. Two shop buildings also are under construction as part of the expansion of the colored schools. An elementary school building at Silver City is under construction to replace the existing building which has become obsolete.

Physical education classes for both white and colored pupils are conducted by personnel of the physical education and recreation section. In addition, personnel from this section provide leadership and guidance for the Boy and Girl Scout organizations on the Isthmus, and supervise such sports and recreational activities as baseball, basketball, handball, football, tennis, boxing, fencing, archery, athletic meets, instruction in swimming and water safety.

POSTAL SYSTEM

In addition to the 11 post offices operated by the bureau of posts at the beginning of the year, 4 Navy and 9 Army post offices were returned to civilian control during January and February 1946, making a total of 24 post offices in operation by the bureau of posts at the close of the year. The bureau of posts continued to handle closed transit mails from the United States to Central and South American countries.

Operations for the past 3 years are summarized in the following table:

	Fiscal year		
	1946	1945	1944
Receipts:			
Sale of air mail postage.....	\$366, 673	\$262, 729	\$313, 192
Sale of all other postage stamps, postal cards, stamp books, etc.....	198, 929	98, 263	93, 481
Money order fees.....	32, 512	28, 583	38, 342
Box rents collected.....	32, 252	31, 076	32, 076
Handling mail—other agencies.....	14, 090	24, 394	28, 013
Other receipts.....	1, 524	2, 475	4, 140
Total receipts.....	645, 980	447, 520	509, 244
Expenses:			
Transportation charges for air mail.....	181, 323	151, 290	267, 839
All other charges and expenses.....	382, 403	325, 430	397, 707
Total expenses.....	563, 726	476, 720	665, 546
Net surplus (deficit).....	82, 254	(29, 200)	(156, 302)
Transferred from postal savings interest account.....		100, 000	200, 000
Reported surplus.....	82, 254	70, 800	43, 698

The only changes made in the air mail postage rates during the year were those in rates to Colombia and Venezuela. A heavy increase in the volume of air mail and parcel post resulted from the return of the Army and Navy post offices to the bureau of posts during

January and February. The transfer of these post offices to civilian control did not, however, affect the air mail and parcel post rates allowable to service personnel. The surplus of \$82,254 for 1946, reported above, was due principally to the reduced transportation charges on air mail allowed by the United States Post Office Department effective April 1, 1945.

Statistics relative to the operation of the Canal Zone postal system for the past 3 fiscal years are covered in the following table:

	Fiscal year		
	1946	1945	1944
Registered and insured article dispatched:			
Official letters and parcels registered free.....	61,694	56,182	57,930
Foreign registered letters.....	39,574	26,443	46,400
Foreign registered parcels.....	625	174	194
Domestic registered letters.....	30,377	25,745	27,878
Domestic registered parcels.....	509	301	534
Insured parcels.....	35,501	10,840	11,054
Total registered and insured articles dispatched.....	168,280	119,685	143,990
Registered and insured articles received:			
Registered articles.....	105,283	79,874	85,655
Insured parcels.....	50,310	48,298	49,026
Foreign parcel post.....	2,617	1,956	1,974
Total registered and insured articles received.....	158,210	130,128	136,655
Dispatches and mail by steamer—Cristobal:			
To the United States.....	124	130	108
To foreign countries.....	723	814	747
Total dispatches sent.....	847	944	855
Receipts of mail by steamer—Cristobal:			
From the United States.....	167	147	119
From foreign countries.....	482	489	522
Total dispatches received.....	649	636	641
Dispatches of mail by steamer—Balboa:			
Total made.....	953	909	666
Total received.....	811	928	838
Dispatches of mail by air—Balboa:			
Total made.....	17,743	14,431	13,887
Total received.....	16,381	14,709	14,271

IMMIGRATION VISAS

During the fiscal year, 263 visas were issued by the executive secretary to alien residents of the Canal Zone traveling to the United States. Of these, 23 were quota immigration visas, 143 were nonquota immigration visas, 76 were nonimmigrant visas, and 21 were transit certificates. Fees collected for visas amounted to \$1,717.75.

RELATIONS WITH THE REPUBLIC OF PANAMA

During the year, correspondence and discussions were conducted between the Governments of the Canal Zone and the Republic of Panama with reference to various matters of local joint interest arising from the relations of the two Governments and the proximity of their respective areas. The matters handled were generally of a routine nature, dealing with customs, immigration, municipal improvements, public health, postal service, repatriation of aliens, and vital statistics.

CUSTOMS

During the war years the bureau of customs assumed the duties of enforcement in the Canal Zone of wartime restrictions placed upon travel and the movement of cargo, mail, and currency, which, in the United States, were handled by the Department of Treasury and Customs. With the termination of hostilities considerable modification in the restrictions was effected and their scope curtailed. The restrictions imposed by the act of July 2, 1940 (export control) and those directed against enemy nations which are set forth in Executive Order 8389 of April 10, 1939, as amended (foreign funds control), are still in effect but the enforcement of the regulations issued has been greatly simplified. It has been possible to discontinue the examination of outgoing baggage and to suspend the examination of communications carried by travelers so that customs operations have for the most part reverted to a peacetime basis.

The following is a statistical summary of the more important items handled by the customs during the past fiscal year, with corresponding figures for the 2 preceding years:

Item	Fiscal year		
	1946	1945	1944
Vessels entered	12, 592	9, 058	5, 582
Vessels cleared	12, 538	9, 033	5, 573
Aircraft entered	3, 899	3, 080	2, 587
Aircraft cleared	3, 897	3, 076	2, 591
Customs releases on shipments consigned to Panama	5, 793	4, 514	3, 974
Shipments of household goods of employees, inspected and sealed for shipment to United States	43	93	123
Invoices certified for shipment to United States	949	2, 092	2, 732
Chinese passengers arriving	68	87	49
Chinese admitted to Panama	46	78	39
Vessels with Chinese crews checked	616	442	219

SHIPPING COMMISSIONER

The shipping commissioner and his deputies have the same authority as shipping commissioners in United States ports and United States consuls in foreign ports with respect to United States seamen. During the fiscal year, 4,227 seamen were shipped in vessels of the United States and 2,992 were discharged. No sick or destitute seamen were returned to the United States at the expense of the appropriation for relief of destitute American seamen, but 1,561 were signed on vessels as workaways, and returned to the United States without expense to the Government.

The total wages earned by seamen who were discharged at Canal Zone ports amounted to \$1,956,699, and the total approved for deductions on account of advances, allotments, fines, slop-chest account, etc., was \$1,096,777. The balance of \$859,922 was either paid to seamen under the supervision of the deputy shipping commissioners or received on deposit for the seamen by the deputy shipping commissioners. The wages, money, and effects of six American seamen, two of whom died in the Canal Zone and four at sea, were handled by the shipping commissioner during the year. Their personal effects and cash amounting to \$2,728 were remitted to the proper courts for disposition.

ADMINISTRATION OF ESTATES

The public administrator takes charge of all estates requiring administration within the Canal Zone that are not handled by others legally entitled to administer them. In the case of estates with total assets exceeding \$1,000 in value, the public administrator charges the regular commissions fixed by law, which are paid into the Treasury of the United States. Commissions amounting to \$1,552 were collected during the fiscal year. The estates of 210 deceased or insane persons, with cash assets of \$52,534 were settled during the fiscal year.

FOREIGN CORPORATIONS

Foreign corporations doing business in the Canal Zone are required to have licenses, and 101 such corporations, the majority of which were steamship lines, steamship agencies, and Government contractors, were licensed during the fiscal year 1946. Fees amounting to \$1,010 were collected.

INSURANCE

The license fee for insurance companies doing business in the Canal Zone is \$10 per year plus a tax of 1½ percent on premiums collected. At the end of the fiscal year 22 insurance companies were licensed to write insurance in the Canal Zone.

Life insurance companies reported that as of December 31, 1944, a total of 1,713 policies were in force. During the calendar year 1945, 189 policies were issued and 133 canceled, leaving 1,769, with an aggregate face value of \$6,563,195, in force as of December 31, 1945. Premium collections on life insurance policies during the calendar year 1945 totaled \$200,038. Claims settled during the year totaled \$36,500.

During the calendar year 1945 the premiums received by miscellaneous insurance companies, including accident, automobile liability, fire, surety, fidelity, etc., but excluding life insurance, amounted to \$258,126. Losses paid during the year totaled \$52,631.

The tax of 1½ percent on premiums collected by all classes of insurance companies amounted to \$6,984 for the calendar year 1945, as compared with \$9,335 during the previous year.

LICENSES

The number of motor vehicle licenses and transfers issued during each of the past 3 fiscal years and the aggregate fees collected therefor are summarized below. These include licenses for official vehicles for which no charge is made:

	Fiscal year		
	1946	1945	1944
Vehicle licenses issued.....	16,685	16,469	16,753
Motor vehicle transfers.....	6,079	5,458	7,213
Total.....	22,764	21,927	23,966
Fees collected.....	\$100,374	\$91,844	\$94,789

In addition to the vehicle licenses covered above, several other types of licenses were issued, such as chauffeurs' licenses, peddler licenses, etc.

RATIONING PROGRAM

The program for the rationing of tires and gasoline which was established in 1943 in accordance with delegation of authority to the Governor by the Office of Price Administration was discontinued during the fiscal year 1946. Gasoline rationing was terminated October 31, 1945, and tire rationing December 31, 1945.

COMMERCIAL AVIATION

Commercial aviation activities remained centered on the Pacific side of the Isthmus at the Canal Zone air terminal. The steadily growing demand for transportation to and from the Canal Zone required that the established air carriers expand passenger capacity by increasing the number of regularly scheduled flights, adding larger aircraft to their fleets, and supplementing their regular flights with special charter flights to and from the Canal Zone. During the last quarter of the fiscal year several new companies began nonscheduled charter flights from the United States to various points in South America, serving the Canal Zone in transit. One carrier was authorized to conduct "round-the-clock operations" over four of its routes into the Canal Zone.

A total of 630 itinerant aircraft was handled at the Canal Zone air terminal during the year, representing a substantial increase over the number handled annually in the war period when civil flying was greatly limited.

Tabulated below is a statistical summary of commercial aviation activities in the Canal Zone for the fiscal year 1946, as compared with the 2 previous years:

Number of passengers carried by regularly scheduled airlines

	Fiscal year		
	1946	1945	1944
Incoming.....	57,493	44,432	39,606
Outgoing.....	54,667	45,584	43,220
Total.....	112,160	90,016	82,826

Air express and mail ¹

[Thousands of pounds]

	Fiscal year		
	1946	1945	1944
Entered.....	2,485	2,203	2,315
Cleared.....	2,109	1,915	1,873
Total.....	4,594	4,118	4,188

¹ Includes transshipped cargo which entered and cleared; excludes weight of transfer mail which does not reach or pass through Canal Zone post offices.

Number of aircraft entered and cleared

	Fiscal year		
	1946	1945	1944
Entered.....	3,953	3,081	2,586
Cleared.....	3,951	3,076	2,591

SECTION V

FINANCIAL AND STATISTICAL STATEMENTS

Financial statements of major interest relative to the operation of The Panama Canal are presented in this section. These statements are abstracted from the annual report of the accounting department of The Panama Canal.

ACCOUNTING SYSTEM

Accounts are maintained in accordance with statutory rules and regulations and accepted principles of appropriation and fund accounting prescribed for governmental bodies. However, the activities being of a quasi-business nature, the accounting system has been adapted to conform as nearly as practicable to the principles and practices approved by the Interstate Commerce Commission and State boards regulating public utilities as well as to procedure followed by comparable industries in the corporate field.

For purposes of evaluating the investment, the close of the construction and development period of the Panama Canal was fixed as July 12, 1920, the date on which the Canal was formally declared open to commercial traffic by Presidential proclamation.

Considered as properly chargeable to construction costs and so reflected in the capital investment account are interest amounting to \$128,991,063 on United States Treasury funds advanced up to July 12, 1920, and the treaty payments to the Republic of Panama consisting of a \$10,000,000 payment in 1904 and annual payments of \$250,000, totaling \$2,000,000 for the period 1913-20. Subsequent annual payments are reflected in the operating accounts. A provision in the Treaty of 1936 with the Republic of Panama increased the annual payment to \$430,000 retroactive to 1934.

Subsequent to the fiscal year 1920, a potential capital interest return of 3 percent has been considered as an unrecorded charge to expenses in determining computed surplus or deficit, while net revenues before interest charges have been used to calculate the actual rate of return on net capital investment.

Based on the foregoing, the gross capital investment at the beginning of the fiscal year 1946 was \$705,356,045.39 which, after deducting depreciation of \$48,523,218.74 and Canal defense property and additional facilities (third locks) amounting to \$142,588,131.07, leaves a net capital investment of \$514,244,695.58. For the fiscal year 1946 there was a net deficit of \$154,638.42 from operations of the Canal and a net revenue of \$876,835.29 from business operations, or a combined net revenue of \$722,196.87.

OPERATIONS OF THE PANAMA RAILROAD COMPANY

The results from the operations of the Panama Railroad Company's various business units on the Isthmus are shown in detail in the accounts of the Panama Railroad Company. The detailed statement of revenues, expenses, and statistics for all railroad industries, changes

in the capital account, and the results from operations of the steamship line, when active, appear in the annual report of the Panama Railroad Company. A review of these activities is presented in section II of this report under the heading "Business operations under the Panama Railroad Company."

PANAMA CANAL OPERATIONS

The major financial results of Panama Canal operations are presented hereinafter in tables Nos. 1 to 28, with supplementary comments and explanations.

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2. Canal general property.
3. Floating plant.
4. Business fixed property.
5. Business equipment.
6. Capital assets, depreciable and nondepreciable.
7. Public works in cities of Panama and Colon.
- 7A. Republic of Panama water and sewerage systems management account.
8. Receipts and disbursements, appropriated funds.
9. Receipts and disbursements, custodial funds.
10. Accounts receivable.
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12. Work in progress.
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15. Accounts payable.
16. Depreciation reserves.
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21. Revenues, expenses, and computed surplus.
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Details of Operation for Profit and Loss

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24. Canal revenues.
25. Canal earnings and expenses.
26. Business expenses, revenues, and profit or loss.

Miscellaneous

27. Balances in appropriations and funds.
28. Funded reserves.

TABLE NO. 1.—General balance sheet, June 30, 1946

ASSETS	
Capital assets:	
Canal general property (table No. 2)---	\$500, 986, 703. 81
Floating plant (table No. 3)-----	9, 876, 628. 20
Canal defense property-----	68, 980, 089. 98
Additional facilities-----	75, 989, 997. 14
Business fixed property (table No. 4)---	44, 414, 975. 53
Business equipment (table No. 5)-----	4, 961, 219. 71
Total capital assets (table No. 6)-----	\$705, 209, 614. 37

TABLE No. 1.—General balance sheet, June 30, 1946—Continued

Custodial funds:	
Special deposit funds:	
Clubhouse funds.....	\$1, 680, 663. 23
Money-order funds.....	10, 913, 532. 30
Security deposit funds.....	2, 940, 137. 69
Total special deposit funds (see contra).....	15, 534, 333. 22
Revenue due U. S. Treasury.....	183, 341. 11
Total custodial funds (table No. 9).....	\$15, 717, 674. 33
Working assets:	
Appropriated funds:	
With U. S. Treasury.....	\$12, 212, 375. 56
With fiscal officers.....	6, 123, 472. 31
Total appropriated funds (table No. 8).....	18, 335, 847. 87
Accounts receivable (table No. 10).....	2, 601, 183. 36
Stores (table No. 11).....	9, 523, 446. 27
Work in progress (table No. 12).....	299, 749. 55
Total working assets.....	30, 760, 227. 05
Deferred charges (table No. 13).....	2, 440, 428. 64
Total assets.....	754, 127, 944. 39

LIABILITIES

Capital investment:	
Net appropriations by Congress.....	\$583, 229, 406. 37
Interest during construction.....	128, 991, 063. 00
Total capital investment (table No. 14).....	\$712, 220, 469. 37
Special deposit accounts (see contra).....	15, 534, 333. 22
Accounts payable (table No. 15).....	2, 874, 463. 11
Reserve for repairs (table No. 17).....	245, 327. 90
Reserve for leave (table No. 18).....	1, 413, 472. 02
Deferred credits (table No. 19).....	3, 898, 160. 52
Revenues and refundments:	
Net revenues to June 30, 1945..... ¹	\$269, 053, 425. 79
Operating profit fiscal year 1946 (table No. 20).....	722, 196. 87
Total net revenues (table No. 21).....	269, 775, 622. 66
Canal depreciation (table No. 16).....	29, 356, 038. 99
Plant depreciation (table No. 16).....	21, 968, 631. 88
Total.....	321, 100, 293. 53
Less: Capital refundments (table No. 22).....	303, 158, 575. 28
Balance, revenues and refundments (table No. 23).....	17, 941, 718. 25
Total liabilities.....	754, 127, 944. 39

¹ Adjusted by \$669,226.38 for write-off of reimbursable capital expenditures, public works, Republic of Panama (table No. 7).

The terms and arrangement of the foregoing balance sheet follow closely the generally accepted principles of corporate accounting, except as to the last item, "Revenues and Refundments." The statutes require that receipts for tolls, civil revenues, and net profits on business operations shall be covered into the United States Treasury, and relinquished from control of The Panama Canal.

Funds for current operating expenses and capital construction are appropriated by the Congress, and for accounting purposes are considered as provided from the tolls and other receipts covered into the Treasury. Practically all receipts other than those cited above are repayable to Canal appropriations, and may be reexpended, but as the Canal is deprived of tolls revenue, its principal source of income, the reexpendable receipts are insufficient to provide for operation and maintenance, thus requiring the Canal to submit its expenditure program annually to the Congress.

Total net revenues, appearing under the caption "Revenues and Refundments," represent the accumulated operating earnings of The Panama Canal before capital interest charges. This net revenue, however, has been covered into the United States Treasury in the form of tolls and other receipts. It therefore follows that net capital refundments and net revenues earned will always be approximately the same, except for the fluctuation of unexpended appropriated cash and other working capital items.

These various fund requirements leave The Panama Canal balance sheet without an equivalent for the usual corporate "Surplus account," since any surplus is included in the tolls covered into the Treasury by law. However, the equivalent for "Surplus account" is shown on table No. 21, which compares "Total net revenues" of \$269,775,622.66, appearing on the balance sheet, with the computed interest on the net capital investment, by fiscal years, beginning with 1921, but no interest charge against the Canal is actually made by the United States Treasury.

TABLE NO. 2.—*Canal general property, fiscal year 1946*

	Balance July 1, 1945	Additions and trans- fers	Retirements and trans- fers	Balance June 30, 1946
Channels, harbors, and basins:				
Balboa to Pedro Miguel	\$24,309,928.86			\$24,309,928.86
Pedro Miguel to Gatun	113,466,691.77			113,466,691.77
Gatun to Cristobal	12,829,445.51			12,829,445.51
Breakwaters:				
Naos Island	1,075,874.10			1,075,874.10
Colon—East	3,994,727.10			3,994,727.10
Colon—West	4,528,829.57			4,528,829.57
Locks:				
Miraflores	24,760,194.36			24,683,045.33
Storehouse Bldg. 9 (demolished)			\$100,000.00	
Storehouse Bldg. 306, Paraiso		\$1,507.95		
Toilet and locker facilities		21,343.02		
Pedro Miguel	16,803,704.32			16,815,423.16
Locomotive pit shelters		11,658.84		
Gatun	37,944,069.49			37,961,773.06
Locomotive pit shelter		513.88		
Storage Bldg. 6		4,959.03		
Toilet and locker facilities		12,076.30		
Plans and studies, postwar construction: Office building		154.36		
Floating caisson	347,868.15			347,868.15
Towing locomotives	1,505,397.32			1,512,691.56
Construction, 2 locomotives		7,294.24		
Dams:				
Miraflores	1,228,561.63			1,228,561.63
Pedro Miguel	457,302.32			457,302.32
Madden	9,773,003.98			9,773,003.98
Gatun	10,475,943.56			10,475,943.56
Gatun-Mindi Levee	148,974.22			148,974.22
Spillways:				
Miraflores	1,398,684.94			1,398,684.94
Gatun	4,323,538.02			4,323,538.02

TABLE NO. 2.—*Canal general property, fiscal year 1946—Continued*

	Balance July 1, 1945	Additions and trans- fers	Retirements and trans- fers	Balance June 30, 1946
Aids to navigation:				
Channel aids.....	\$627,656.80			\$627,656.80
Transit aids.....	24,191.04			24,191.04
Coastal aids.....	175,069.78			175,069.78
Lighthouse depot, Gatun.....	204,061.81			204,061.81
Wharves and piers:				
Balboa (Nos. 14 to 19).....	4,325,696.98			4,778,492.50
Construction, dock, dredging division.....		\$452,795.52		
Gamboa.....	295,430.46			295,430.46
Cristobal (Nos. 6, 13, 14, and 15).....	3,627,061.82			3,627,061.82
Drydocks:				
Balboa.....	3,645,313.06			3,647,426.98
Sewage disposal system.....		2,113.92		
Cristobal.....	672,437.70			672,437.70
Coaling plants:				
Balboa.....	2,034,568.35			2,034,568.35
Cristobal.....	3,679,797.59			3,592,797.59
Wharf bunker (demolished).....			\$37,000.00	
Dredging division plant.....	984,705.16			984,705.16
Ferry plants:				
Thatcher Ferry plant.....	1,168,601.38			1,168,601.38
Miraflores Ferry plant.....	66,242.15			66,242.15
Titles and treaty rights:				
Purchase price, New Panama Canal Com- pany.....	131,717,335.97			131,717,335.97
Treaty payment to Republic of Panama, 1904.....	10,000,000.00			10,000,000.00
Annual treaty payments to Republic of Panama, 1913-20.....	2,000,000.00			2,000,000.00
Relocation of Panama Railroad.....	9,800,626.46			9,800,626.46
Re-equipment of Panama Railroad.....	3,247,332.11			3,247,332.11
Depopulation, Canal Zone.....	2,701,016.24			2,701,016.24
General buildings and structures:				
Office buildings.....	2,139,263.89			2,139,263.89
Gorgas hospital.....	2,219,973.08			2,231,003.50
Equipment for Dental Laboratory.....		8,854.00		
Designs and studies, postwar construc- tion: Clinic, admitting office and auditorium.....		2,176.42		
Corozal Hospital.....	760,065.83			760,065.83
Colon Hospital.....	708,001.95			781,201.46
Administration building:				
Alter pavilion A.....		11,602.35		
Alter pavilion B.....		10,954.87		
Repairs to roof.....		15,113.88		
Replace water pipe.....		5,451.80		
Alter service building.....		412.99		
Construct chapel.....		19,456.49		
Construct utility shed.....		7,174.14		
Fence hospital area.....		3,032.99		
Margarita Hospital.....	401,394.54			401,394.54
Dispensaries.....	346,956.27			387,144.60
Balboa: Alterations to gold dispensary.....		2,520.30		
La Boca: Construction silver dispen- sary.....		19,519.83		
Red Tank.....		18,148.20		
Palo Seco Colony.....	187,183.66			190,551.16
Construction motion picture projection booth, recreational hall, Building 8.....		3,367.50		
Quarantine stations.....	65,392.70			65,780.35
Designs and studies—postwar construc- tion:				
Barracks for Americans.....		140.72		
Barracks for silver employees.....		132.79		
Guard house.....		114.14		
Other health department structures.....	96,814.41			118,420.87
Ancon: Construction utility building.....		9,947.40		
Corozal: Construction public toilets— cemetery.....		3,680.47		
Mount Hope: Construction office building—cemetery.....		7,978.59		
Recreational structures.....	281,627.49			289,095.72
Balboa: Construction addition to gym- nasium.....		6,885.43		
Paraiso: Alter silver gymnasium.....		582.80		
Post offices.....	238,468.34			238,468.34

¹ Original purchase price of \$40,000,000.00, less Panama Railroad Company capital stock and sales and transfers of property acquired.

TABLE NO. 2.—*Canal general property, fiscal year 1946—Continued*

	Balance July 1, 1945	Additions and trans- fers	Retirements and trans- fers	Balance June 30, 1946
General buildings and structures—Continued				
Schoolhouses	\$2, 643, 288. 42			\$2, 860, 145. 26
Balboa: Designs and studies—postwar construction, auditorium, high school and junior college		\$515. 91		
La Boca:				
Construction silver vocational school		74, 082. 16		
Designs and studies—postwar con- struction: Silver high school		1, 661. 22		
Red Tank: Construction annex to Building 577		229. 50		
Paraiso: Construction silver elemen- tary school		305. 16		
Silver City:				
Construction silver elementary school		126, 560. 92		
Construction silver vocational school		12, 626. 52		
Designs and studies—postwar con- struction: Silver high school		875. 45		
Fire stations	121, 749. 77			121, 749. 77
Police stations	284, 387. 98			284, 387. 98
Prisons	62, 066. 42			79, 899. 37
Construction office building		17, 832. 95		
Courthouses	187, 732. 73			187, 732. 73
Other buildings and structures	631, 918. 28			631, 685. 06
Balboa: Designs and studies—postwar construction: D. Q. M. office, ware- house and mattress factory		1, 057. 48		
La Boca: Ferry waiting room (sold)			\$2, 516. 70	
Paraiso:				
Alter D. Q. M. office		124. 58		
Alter D. Q. M. paint shop		102. 18		
Alter fire-truck house		152. 18		
Alter bus-stop shelters		732. 40		
Alter lodge hall		114. 66		
Permanent town sites	2, 270, 701. 13			2, 360, 692. 07
Ancon		19, 247. 75		
Balboa		19, 322. 97		
La Boca		364. 72		
Corozal		560. 30		
Miraflores		240. 20		
Red Tank		117. 49		
Paraiso		7, 017. 74		
Gamboa		3. 03		
Margarita		31, 508. 91		
Mount Hope		198. 15		
Camp Coiner		8, 079. 60		
Silver City		3, 267. 70		
Colon		62. 38		
Roads, streets, and sidewalks	5, 785, 984. 96			5, 944, 263. 05
Ancon		31, 960. 16		
Balboa		79, 724. 88		
La Boca		36		
Corozal		11, 692. 73		
Paraiso		8, 544. 00		
Margarita		10, 825. 79		
Camp Coiner		11. 43		
Cristobal		15, 518. 74		
Sewer system	915, 875. 83			971, 885. 22
Pacific side—general sewage disposal studies		4, 681. 23		
Ancon		8, 734. 84		
Balboa		9, 664. 05		
La Boca		447. 22		
Corozal		3, 830. 72		
Red Tank		65. 48		
Paraiso		7, 453. 28		
Atlantic side—general sewage disposal studies		159. 63		
Margarita		5, 944. 22		
Mount Hope		2, 720. 27		
Camp Coiner		10, 301. 42		
Silver City		1, 676. 11		
Colon		330. 92		

TABLE NO. 2.—*Canal general property, fiscal year 1946—Continued*

	Balance July 1, 1945	Additions and trans- fers	Retirements and trans- fers	Balance June 30, 1946
Street lighting system.....	\$239, 736. 54			\$253, 448. 90
Ancon.....		\$378. 34		
Balboa.....		385. 91		
La Boca.....		300. 00		
Corozal.....		4, 800. 00		
Pedro Miguel.....		4, 500. 00		
Paraiso.....		1, 288. 78		
Mount Hope.....		1, 450. 00		
Margarita.....		609. 33		
Interest during construction period.....	128, 991, 063. 00			128, 991, 063. 00
Total, Canal general property.....	499, 949, 591. 30	1, 226, 629. 21	\$189, 516. 70	500, 986, 703. 81
Canal defense property.....	68, 275, 731. 11	704, 358. 87		68, 980, 089. 98
Construction, additional facilities.....	74, 312, 399. 96			75, 989, 997. 14
Third set locks.....		1, 458, 690. 80		
Isthmian Canal studies, 1947.....		218, 906. 38		

TABLE NO. 3.—*Floating plant, fiscal year 1946*

	Balance, July 1, 1945	Additions and transfers	Retirements and transfers	Balance, June 30, 1946
Tugs and crane boats.....	\$3, 011, 583. 32			\$3, 011, 583. 32
Launches.....	912, 014. 77			929, 060. 04
New construction:				
<i>Corbina</i> (completed).....		\$14, 146. 28		
<i>Dove</i> (completed).....		10, 855. 59		
<i>Emerald</i> (completed).....		25, 676. 09		
<i>Quail</i> (part).....		9, 159. 06		
Surveyed:				
<i>Bonito</i>			\$8, 035. 50	
<i>Empire</i>			15, 292. 57	
<i>Mary B</i>			7, 867. 75	
<i>Rodman</i>			12, 595. 93	
Dredges.....	2, 550, 068. 51			2, 600, 911. 92
<i>Cascadas</i> —reboiling.....		50, 843. 41		
Dump scows.....	1, 583, 332. 51			1, 583, 332. 51
Machine barges.....	1, 255, 218. 95			1, 251, 686. 30
Barge No. 169, surveyed.....			3, 532. 65	
Lighters.....	440, 977. 36			440, 977. 36
Launch repair barges.....	27, 763. 78			27, 763. 78
Anchor barge.....	31, 312. 97			31, 312. 97
Total, floating plant.....	9, 812, 272. 17	111, 680. 43	47, 324. 40	9, 876, 628. 20

TABLE NO. 4.—*Business fixed property, fiscal year 1946*

	Balance July 1, 1945	Additions and transfers	Retirements and transfers	Balance June 30, 1946
Hydroelectric plant, Gatun.....	\$1, 937, 793. 49			\$2, 175, 195. 55
4,500-kilowatt turbogenerators:				
Unit No. 5.....		\$166, 251. 26		
Unit No. 6.....		71, 150. 80		
Diesel-electric plant, Miraflores.....	1, 969, 232. 85			1, 969, 232. 85
Substations.....	1, 598, 843. 33			1, 598, 843. 33
Transmission system.....	1, 560, 695. 81			1, 560, 695. 81
Distribution system.....	2, 083, 584. 96			2, 144, 014. 12
Ancon.....		8, 204. 90		
Balboa.....		4, 077. 93		
La Boca.....		6, 388. 82		
Corozal.....		341. 02		
Miraflores.....		97. 86		
Red Tank.....		453. 09		
Paraiso.....		2, 138. 14		
Gamboa.....		512. 21		
Margarita.....		22, 288. 49		
Mount Hope.....		507. 50		
Camp Coiner.....		3, 538. 50		

TABLE No. 4.—*Business fixed property, fiscal year 1946—Continued*

	Balance July 1, 1945	Additions and transfers	Retirements and transfers	Balance June 30, 1946
Distribution system—Continued				
Silver City		\$4, 630. 09		
Cristobal		6, 700. 00		
Colon		550. 61		
Madden Dam system	\$1, 728, 152. 54			\$1, 728, 152. 54
Total, electric power system	10, 878, 302. 98	297, 831. 22		11, 176, 134. 20
Electric work	381, 272. 02			381, 272. 02
Zone water system	1, 697, 824. 43			
Reservoir, Ancon, low service			\$13, 097. 23	1, 743, 996. 63
Distribution lines:				
Ancon		29, 772. 47		
Balboa		13, 262. 80		
La Boca		1, 036. 82		
Miraflores		1, 341. 49		
Red Tank		66. 20		
Paraiso		3, 234. 55		
Gamboa		75. 43		
Margarita		3, 899. 32		
Mount Hope		200. 07		
Camp Coiner		4, 133. 28		
Silver City		2, 200. 77		
Colon		46. 23		
Zone, Panama water system	3, 758, 875. 99			3, 907, 049. 39
Filter plant building; Miraflores: Additional header installations		17, 857. 09		
Reservoir, Ancon: Low service			44, 296. 35	
Mains:				
Miraflores to Pedro Miguel			5, 361. 70	
Gamboa to Miraflores		179, 974. 36		
Zone, Colon water system	1, 520, 061. 54			1, 520, 061. 54
Total, water system	6, 976, 761. 96	257, 100. 88	62, 755. 28	7, 171, 107. 56
Municipal engineering work	143, 018. 12			143, 018. 12
Balboa shops	2, 488, 454. 94			2, 488, 454. 94
Cristobal shops	580, 866. 47	23, 139. 41		604, 005. 88
Total, mechanical shops	3, 069, 321. 41	23, 139. 41		3, 092, 460. 82
Balboa oil-handling plant	930, 926. 46			935, 328. 92
Purchase and installation of 400 horsepower boiler		4, 402. 46		
Cristobal oil-handling plant	1, 253, 114. 90			1, 255, 299. 47
Purchase and installation of 400-horsepower boiler		2, 184. 57		
Total, oil-handling plants	2, 184, 041. 36	6, 587. 03		2, 190, 628. 39
General storehouses	1, 687, 550. 40			1, 687, 550. 40
Motor transportation division	190, 171. 46			402, 802. 93
Repair shops		201, 247. 32		
Addition, Bldg. 5045		11, 284. 15		
Motor car repair shops	201, 247. 32		201, 247. 32	
Building division	83, 018. 21			83, 018. 21
Gold quarters	14, 455, 356. 68			15, 254, 315. 15
New quarters:				
Ancon-Balboa		391, 311. 31		
Margarita		358, 768. 25		
Alterations and improvements		39, 012. 39		
Preliminary plans and studies		13, 566. 52		
Cristobal Bldg. No. 1605 (sold)			3, 400. 00	
Pedro Miguel Bldg. No. 92 (sold)			200. 00	
Silver quarters	1, 835, 876. 33			2, 040, 185. 93
New quarters:				
Paraiso		77, 648. 66		
Camp Coiner		50, 969. 97		
Silver City		40, 899. 33		
Alterations and improvements:				
Paraiso		2, 111. 95		
Gatun		3, 005. 03		
Mount Hope		12, 449. 02		
Conversion to Silvertown: Paraiso		7, 813. 07		
Summit Bldg. No. 5 (demolished)			3, 849. 39	
Plans and preparation of sites		13, 261. 96		
Gasoline service stations	48, 480. 69			48, 480. 69
Clubhouse business structures	758, 691. 96			743, 901. 11
Balboa Clubhouse:				
Swimming pool grandstand (sold)			3, 500. 00	
Balboa boathouse (demolished)			11, 290. 85	
Total, business fixed property	42, 893, 110. 90	1, 808, 107. 47	286, 242. 84	44, 414, 975. 53

TABLE No. 5.—*Business equipment, fiscal year 1946*

	Balance July 1, 1945	Additions and transfers	Retirements and transfers	Balance June 30, 1946
Electric power system.....	\$322, 028. 09	\$6, 250. 00		\$328, 278. 09
Electrical work.....	9, 981. 85		\$3, 050. 30	6, 931. 55
Municipal work.....	288, 268. 01	10, 715. 00	6, 410. 00	292, 573. 01
Mechanical shops.....	2, 397, 368. 92	259, 225. 67	48, 243. 60	2, 608, 350. 99
General storehouses.....	168, 241. 55			168, 241. 55
Motor transportation.....	1, 161, 303. 06	108, 260. 36	37, 069. 35	1, 232, 494. 07
Motor car repair shops.....	52, 810. 77		52, 810. 77	
Building division.....	179, 626. 64	6, 147. 18		185, 773. 82
Panama Canal press.....	138, 576. 63			138, 576. 63
District quartermasters' supplies.....	1, 727. 38		1, 727. 38	
Total, business equipment.....	4, 719, 932. 90	390, 598. 21	149, 311. 40	4, 961, 219. 71

TABLE No. 6.—*Capital assets, depreciable and nondepreciable, fiscal year 1946*

	Depreciable	Nondepreci- able ¹	Balance June 30, 1946
Canal general property:			
Channels, harbors, and basins.....		\$150, 606, 066. 14	\$150, 606, 066. 14
Breakwaters.....		9, 599, 430. 77	9, 599, 430. 77
Locks.....	\$66, 044, 568. 97	15, 276, 232. 29	81, 320, 801. 26
Dams:			
Madden.....	5, 508, 509. 79	4, 264, 494. 19	9, 773, 003. 98
Other.....		12, 310, 781. 73	12, 310, 781. 73
Spillways.....	3, 791, 569. 33	1, 930, 653. 63	5, 722, 222. 96
Aids to navigation.....	1, 030, 979. 43		1, 030, 979. 43
Wharves and piers.....	8, 700, 984. 78		8, 700, 984. 78
Drydocks.....	3, 341, 443. 14	978, 421. 54	4, 319, 864. 68
Coaling plants.....	5, 627, 365. 94		5, 627, 365. 94
Dredging division plant.....	984, 705. 16		984, 705. 16
Ferry plants.....	1, 234, 843. 53		1, 234, 843. 53
Titles and treaty rights.....		59, 466, 310. 78	59, 466, 310. 78
Office buildings.....	2, 139, 263. 89		2, 139, 263. 89
Gorgas Hospital.....	2, 231, 003. 50		2, 231, 003. 50
Corozal Hospital.....	760, 065. 83		760, 065. 83
Colon Hospital.....	781, 201. 46		781, 201. 46
Margarita Hospital.....	401, 394. 54		401, 394. 54
Dispensaries.....	387, 144. 60		387, 144. 60
Palo Seco Colony.....	190, 551. 16		190, 551. 16
Quarantine stations.....	65, 780. 35		65, 780. 35
Other health department buildings.....	118, 420. 87		118, 420. 87
Recreational structures.....	289, 095. 72		289, 095. 72
Post offices.....	238, 468. 34		238, 468. 34
Schoolhouses.....	2, 860, 145. 26		2, 860, 145. 26
Fire stations.....	121, 749. 77		121, 749. 77
Police stations.....	284, 387. 98		284, 387. 98
Prisons.....	79, 899. 37		79, 899. 37
Courthouses.....	187, 732. 73		187, 732. 73
Other buildings and structures.....	631, 685. 06		631, 685. 06
Permanent town sites.....		2, 360, 692. 07	2, 360, 692. 07
Roads, streets, and sidewalks.....		5, 944, 263. 05	5, 944, 263. 05
Sewer system.....		971, 885. 22	971, 885. 22
Street lighting system.....		253, 448. 90	253, 448. 90
Interest during construction period.....		128, 991, 063. 00	128, 991, 063. 00
Total, Canal general property (table No. 2).....	108, 032, 960. 50	392, 953, 743. 31	500, 986, 703. 81
Floating plant (table No. 3).....	9, 876, 628. 20		9, 876, 628. 20
Canal defense property (incomplete).....		68, 980, 089. 98	68, 980, 089. 98
Construction, additional facilities (incomplete).....		75, 989, 997. 14	75, 989, 997. 14
Business fixed property (table No. 4).....	44, 414, 975. 53		44, 414, 975. 53
Business equipment (table No. 5).....	4, 961, 219. 71		4, 961, 219. 71
Total, capital assets.....	167, 285, 783. 94	537, 923, 830. 43	705, 209, 614. 37

¹ Channels, harbors, basins, breakwaters, and municipal assets are maintained at original values from current operating expenses. Other nondepreciable property includes excavation and earth fills at locks, dams, and drydocks, and earth saddles at Madden Dam; also certain projects which were incomplete at the close of the fiscal year.

TABLE NO. 7.—*Public works in cities of Panama and Colon, fiscal year 1946*

	Panama	Colon	Total
Status of capital cost to Dec. 31, 1945:			
Construction cost:			
Waterworks and sewers.....	\$876,353.22	\$623,883.68	\$1,500,236.90
Pavements.....	592,913.23	625,619.03	1,218,532.26
Total construction cost.....	1,469,266.45	1,249,502.71	2,718,769.16
Amortization:			
Waterworks and sewers.....	656,603.77	467,353.53	1,123,957.30
Pavements.....	448,261.77	477,323.71	925,585.48
Total amortization.....	1,104,865.54	944,677.24	2,049,542.78
Capital cost reimbursable:			
Waterworks and sewers.....	219,749.45	156,530.15	376,279.60
Pavements.....	144,651.46	148,295.32	292,946.78
Capital value, Dec. 31, 1945:	364,400.91	304,825.47	669,226.38
Written off, on account of the transfer of the properties to the Republic of Panama, on authority of Executive Order No. 9551, Public Law No. 48 of May 3, 1943.....	364,400.91	304,825.47	669,226.38
Operating detail, fiscal year 1946:			
Operation, maintenance, and repairs:			
Waterworks and sewers.....	320,600.18	232,573.79	553,173.97
Pavements.....	9,283.67	3,317.42	12,601.09
Proportion, zone system.....	73,786.71	19,826.06	93,612.77
Street cleaning and garbage collection.....	117,083.71	45,098.21	162,181.92
Total.....	520,754.27	300,815.48	821,569.75
Interest at 2 percent per annum:			
Waterworks and sewers.....	2,220.87	1,581.95	3,802.82
Pavements.....	1,461.91	1,498.73	2,960.64
Proportion, zone system.....	10,323.67	3,596.05	13,919.72
Total.....	14,006.45	6,676.73	20,683.18
Amortization:			
Waterworks and sewers.....	9,450.52	6,731.72	16,182.24
Pavements.....	6,220.86	6,377.57	12,598.43
Total.....	15,671.38	13,109.29	28,780.67
Total charged to water rentals.....	550,432.10	320,601.50	871,033.60
Water rental collections in the Republic of Panama.....	550,432.10	320,601.50	871,033.60

Until December 31, 1945, The Panama Canal supplied water to the cities of Panama and Colon from the Canal Zone water system, and maintained the water-distribution system, the sewerage system, and the streets in the two cities under contracts entered into between The Panama Canal and the Republic of Panama in 1907 and 1910. The Panama Canal collected the water rentals from the residents of these two cities and used the funds to cover the cost of water and maintenance of the water and sewerage systems and the streets, interest on the unamortized investment at 2 percent per annum and amortization based on 50 years from 1907.

Effective January 1, 1946, the old contracts were superseded by the instrument of transfer dated December 28, 1945, in conformity with Executive Order No. 9551 of May 16, 1945, and pursuant to the provisions of Public Law No. 48, approved May 3, 1943, under which the water and sewerage systems were transferred to the Republic of Panama, and under which provision was made for The Panama Canal to supply water to the cities of Panama and Colon at the cost to the United States at the boundary. By contract of management dated December 28, 1945, The Panama Canal is authorized to man-

age, operate, and maintain the public water and sewerage systems owned by the Republic of Panama and maintain and repair the public street pavements in the cities of Panama and Colon for the account of the Republic of Panama. (See Table No. 7-A.)

Interest on the investment amounting to \$20,683.18 and amortization amounting to \$28,780.67 for the period July 1, 1945 through December 31, 1945, have been covered into the United States Treasury as miscellaneous receipts, making the totals to date \$1,894,419.50 for interest, and \$2,049,542.78 for amortization.

TABLE NO. 7-A.—*Republic of Panama water and sewerage systems management account, fiscal year 1946*

	Panama	Colon	Total
OPERATING DETAIL, PERIOD JAN. 1, 1946 THROUGH JUNE 30, 1946			
Income:			
Private consumers.....	\$357,626.85	\$199,894.45	\$557,521.30
Panama Government agencies.....	22,048.10	7,522.40	29,570.50
U. S. Government agencies.....	843.30	3,360.30	4,203.60
Total income.....	380,518.25	210,777.15	591,295.40
Expenses:			
Cost of water at boundary.....	121,237.45	25,441.22	146,678.67
Repairs to water mains.....	22,948.77	10,198.82	33,147.59
Repairs to sewer mains.....	14,921.82	6,389.29	21,311.11
Operation of sump pump stations.....		6,178.13	6,178.13
Inspection of plumbing.....	3,865.75	2,111.01	5,976.76
Cost of collection water rentals.....	6,544.41	2,807.20	9,351.61
Salaries paid employees of the Republic of Panama.....	1,800.00	525.00	2,325.00
Repairs to pavements.....	16,447.57	6,488.13	22,935.70
Street cleaning and garbage disposal.....	118,785.05	44,990.48	163,775.56
Total expenses.....	306,550.85	105,129.28	411,680.13
Net income.....	73,967.40	105,647.87	179,615.27

In conformity with Executive Order No. 9551, and pursuant to the provisions of Public Law No. 48, approved May 3, 1943, all right, title, and interest of the United States in and to the water and sewerage systems in the cities of Panama and Colon have been transferred to the Republic of Panama effective January 1, 1946.

Under the provisions of the instrument of transfer dated December 28, 1945, The Panama Canal supplies water to the cities of Panama and Colon at the cost to the United States at the boundary, computed as provided in the instrument of transfer.

Under the provisions of the management contract dated December 28, 1945, The Panama Canal (with certain exceptions) manages, operates, and maintains the public water and sewerage systems owned by the Republic of Panama and maintains and repairs the public street pavements in the cities of Panama and Colon for the account of the Republic of Panama.

TABLE No. 8.—Appropriated funds—Receipts and disbursements, fiscal year ended June 30, 1946

	Disbursing clerk, Wash- ington, D. C.	Paymaster, Canal Zone	Collector, Canal Zone	Total	U. S. Treasury	Total
ACCOUNTABLE BALANCE JULY 1, 1945, BY APPROPRIATIONS AND FUNDS						
Maintenance and operation, Panama Canal	\$917,865.85	\$4,156,446.61	\$459,196.83	\$5,533,509.29	\$20,997,198.60	\$26,530,707.89
Sanitation, Canal Zone, Panama Canal	17,474.98	32,046.72	32,046.72	216,517.33	326,506.72	543,024.05
Civil government, Panama Canal and Canal Zone	2,677.99	101,419.52	2,471.35	106,568.86	65,673.54	172,242.40
Postal funds, Canal Zone (special fund)	6,307.30	7,208.12	65,504.75	79,020.17	170,835.46	249,855.63
Repatriation of unemployed aliens, Panama Canal		5,471.46	164.87	5,636.33	65,000.00	70,636.33
Memorial to Maj. Gen. George W. Goethals					156,508.58	156,508.58
Construction, additional facilities, Panama Canal	39,530.17	158,605.80	2,829.14	200,965.11	2,752,022.66	2,952,987.77
Working funds, Panama Canal:						
Access roads projects						13,898.77
Hospitalization of military personnel		32,398.00		32,398.00	62,000.00	94,398.00
Transfer from defense public works, Federal Works Agency—Community facilities		27,753.41		27,753.41	41,561.00	69,314.41
Total	983,856.29	4,670,197.32	562,213.66	6,216,267.27	24,637,306.56	30,853,573.83
APPROPRIATIONS, FISCAL YEAR 1946						
Maintenance and operation, Panama Canal					4,724,000.00	14,724,000.00
Sanitation, Canal Zone, Panama Canal					2,261,200.00	12,261,200.00
Civil government, Panama Canal and Canal Zone					1,756,000.00	11,756,000.00
Construction, additional facilities, Panama Canal					3,428,600.00	23,428,600.00
Working funds, Panama Canal—Hospitalization of military personnel					269,745.00	269,745.00
Total					12,439,545.00	12,439,545.00
TRANSFERS BETWEEN FISCAL OFFICERS						
Maintenance and operation, Panama Canal	\$9,500,000.00	27,930,950.52		37,430,950.52	500,999.13	37,931,949.65
Sanitation, Canal Zone, Panama Canal	300,000.00	4,026,247.00		4,326,247.00	147,241.67	4,473,488.67
Civil government, Panama Canal and Canal Zone	60,000.00	1,905,873.30		1,965,873.30	9,261.47	1,975,134.77
Postal funds, Canal Zone (special fund)	10,000.00	400,000.00		410,000.00	564,710.80	974,710.80
Repatriation of unemployed aliens, Panama Canal		20,104.87		20,104.87		20,104.87
Construction, additional facilities, Panama Canal	50,000.00	1,946,947.67		1,996,947.67	2,599.86	1,999,547.62
Working funds, Panama Canal:						
Access roads projects	12,101.10			12,104.10	12,104.10	24,208.20
Hospitalization of military personnel	35,967.00	331,745.00		367,712.00	335,967.00	403,679.00
Transfer from defense public works, Federal Works Agency—Community facilities		41,561.00		41,561.00	37,694.11	79,255.11
Total	9,968,071.10	36,603,439.36		46,571,510.46	1,310,578.23	47,882,138.69

COLLECTIONS REPAYABLE TO APPROPRIATIONS

Maintenance and operation, Panama Canal.....	514,805.13	1,445,024.17	24,650,136.16	26,609,965.46	191,503.33	26,801,468.79
Sanitation, Canal Zone, Panama Canal.....	147,607.07		1,606,004.74	1,753,612.71	1,200.23	1,754,812.94
Civil government, Panama Canal and Canal Zone.....	9,822.86	451,948.32	206,491.04	667,902.22	6.67	667,908.89
Postal funds, Canal Zone (special fund).....	9,900.00		636,040.10	645,940.10		645,940.10
Reparation of unemployed aliens, Panama Canal.....		164.87		164.87		164.87
Construction, additional facilities, Panama Canal.....	2,599.95		45,846.96	48,446.91		48,446.91
Judgments, court of claims, Panama Canal.....					5,157.57	5,157.57
Total.....	684,435.91	1,897,137.36	27,144,519.00	29,726,092.27	197,867.80	29,923,960.07
Total to be accounted for.....	11,636,363.30 ¹	43,170,824.04	27,706,732.66	82,513,920.00	38,585,297.59	121,099,217.59
COVERED INTO THE U. S. TREASURY						
Business net revenues, fiscal year 1945, maintenance and operation, Panama Canal.....						1,429,812.59
REFUNDED TO THE UNITED STATES TREASURY						
In accordance with the First Supplemental Surplus Appropriation Recission Act, 1946, Public Law 301, approved Feb. 15, 1946: Maintenance and operation, Panama Canal.....						5,000,000.00
TRANSFERS BETWEEN FISCAL OFFICERS						
Maintenance and operation, Panama Canal.....	500,999.13		24,930,950.52	25,431,949.65	12,500,000.00	37,931,949.65
Sanitation, Canal Zone, Panama Canal.....	147,241.67		1,626,247.00	1,773,488.67	2,700,000.00	4,473,488.67
Civil government, Panama Canal and Canal Zone.....	9,261.47		205,873.30	215,134.77	1,975,134.77	1,975,134.77
Postal funds, Canal Zone (special fund).....	9,900.00		554,810.80	564,710.80	410,000.00	974,710.80
Reparation of unemployed aliens, Panama Canal.....			164.87	164.87	20,000.00	20,164.87
Construction, additional facilities, Panama Canal.....	2,599.95		46,947.67	49,547.62	1,950,000.00	1,999,547.62
Working funds, Panama Canal.....						
Access roads projects.....		12,104.10		12,104.10	12,104.10	24,208.20
Hospitalization of military personnel.....		35,967.00		35,967.00	367,712.00	403,679.00
Transfer from defense public works, Federal Works Agency—Community facilities.....		37,694.11		37,694.11	41,561.00	79,255.11
Total.....	670,002.22	85,765.21	27,364,994.16	28,120,761.59	19,761,377.10	47,882,138.69
DISBURSEMENTS						
Maintenance and operation, Panama Canal.....	9,347,201.49	30,029,527.73		39,376,729.22	49,367.44	39,426,096.66
Sanitation, Canal Zone, Panama Canal.....	314,044.27	3,873,267.72		4,187,911.99	9.26	4,187,921.25
Civil government, Panama Canal and Canal Zone.....	61,384.70	2,336,811.16		2,398,195.86		2,398,195.86
Postal funds, Canal Zone (special fund).....	13,679.81	353,736.94		367,416.75	89,503.96	456,920.71
Reparation of unemployed aliens, Panama Canal.....		14,917.42		14,917.42		14,917.42

¹ Includes supplemental appropriations of \$57,000, \$477,000, and \$361,000 for maintenance and operation, Panama Canal, sanitation, Canal Zone, Panama Canal, and civil government, Panama Canal and Canal Zone, appropriations, respectively, for basic pay increases and overtime payments and \$18,000 for other expenses of the schools division under the latter appropriation.

² Includes \$2,618,000 in the 1947 appropriation act made available in the fiscal year 1946.

TABLE No. 8.—*Appropriated funds—Receipts and disbursements, fiscal year ended June 30, 1946—Continued*

	Disbursing clerk, Wash- ington, D. C.	Paymaster, Canal Zone	Collector, Canal Zone	Total	U. S. Treasury	Total
Construction, additional facilities, Panama Canal	\$58,339.93	\$1,517,202.86		\$1,575,542.79		\$1,575,542.79
Judgments, court of claims, Panama Canal					\$5,157.57	5,157.57
Working funds, Panama Canal						
Access roads projects	12,104.10	1,794.67		13,898.77		13,898.77
Hospitalization of military personnel	35,967.00	267,486.00		303,453.00		303,453.00
Transfer from defense public works, Federal Works Agency—Community facilities		31,620.30		31,620.30		31,620.30
Total	9,843,321.30	38,426,304.80		48,269,626.10	181,732.34	48,451,418.44
ACCOUNTABLE BALANCE JUNE 30, 1946						
Maintenance and operation, Panama Canal	1,084,470.36	3,502,893.57	\$178,382.47	4,765,746.40	7,434,521.03	12,200,267.43
Sanitation, Canal Zone, Panama Canal	3,197.01	319,974.91	11,804.46	334,976.38	36,139.36	371,115.74
Civil government, Panama Canal and Canal Zone	1,554.63	122,429.98	3,089.09	127,073.73	70,941.68	198,015.43
Postal funds, Canal Zone (special fund)	2,627.49	53,471.18	146,734.05	202,832.72	230,042.30	433,875.02
Repatriation of unemployed aliens, Panama Canal		10,883.78		10,883.78	43,000.00	53,883.78
Memorial to Maj. Gen. George W. Goethals					156,808.58	156,808.58
Construction, additional facilities, Panama Canal	31,190.24	588,350.61	1,728.43	621,269.28	4,233,222.61	4,854,491.89
Working funds, Panama Canal: Hospitalization of military personnel		60,690.00		60,690.00		60,690.00
Total	1,123,039.78	4,658,694.03	341,738.50	6,123,472.31	12,212,375.56	18,335,847.87
Total accounted for	11,636,363.30	43,170,824.04	27,706,732.66	82,513,920.00	38,585,297.59	121,099,217.59

TABLE No. 9.—*Custodial funds—Receipts and disbursements, fiscal year ended June 30, 1946*

ACCOUNTABLE BALANCE JULY 1, 1945					
Disbursing clerk, Washington, D. C.	Paymaster, Canal Zone	Collector, Canal Zone	Total	U. S. Treasury	Total
Revenue due U. S. Treasury		\$141, 247.76	\$141, 247.76		\$141, 247.76
Security deposits		2, 138, 005.75	2, 442, 021.16		2, 442, 021.16
Clubhouse funds	\$109, 407.56	21, 839.95	21, 839.95	\$1, 414, 881.07	1, 436, 721.02
Money order funds		43, 884.76	43, 884.76	10, 513, 039.04	10, 556, 923.80
War savings bonds funds		50.00	50.00	16, 468.81	16, 518.81
Total	109, 407.56	2, 345, 028.22	2, 649, 043.63	11, 944, 388.92	14, 593, 432.55
RECEIPTS					
Revenue due U. S. Treasury		15, 046, 292.39	15, 050, 088.13		15, 050, 088.13
Security deposits	3, 694.81	100.93	48, 082, 364.64		48, 082, 364.64
Clubhouse funds	566, 017.34	13, 469, 382.10	5, 063, 863.97		5, 063, 863.97
Money order funds			7, 403, 933.21		7, 403, 933.21
War savings bonds funds			409, 683.95		409, 683.95
Total	569, 712.15	13, 469, 483.03	76, 010, 133.90		76, 010, 133.90
Total	679, 119.71	13, 664, 090.88	78, 659, 177.53		
Transfer to U. S. Treasury:					
Clubhouse funds		(5, 043, 423.28)	(5, 043, 423.28)	5, 043, 423.28	
Money order funds		(6, 848, 344.16)	(6, 848, 344.16)	6, 848, 344.16	
War Savings bonds funds		(409, 733.95)	(409, 733.95)	409, 733.95	
Total to be accounted for	679, 119.71	13, 664, 090.88	66, 357, 676.14	24, 245, 890.31	90, 603, 566.45
COVERED INTO U. S. TREASURY					
Revenue due U. S. Treasury	3, 687.33	100.93	15, 020, 430.92		15, 024, 219.18
Security deposits	366, 165.93	13, 481, 960.15	33, 736, 322.03		47, 584, 448.11
TRANSFERS AND REFUNDS					
DISBURSEMENTS					
Clubhouse funds					
Money order funds		530, 580.00	530, 580.00		4, 819, 921.76
War Savings bonds funds					7, 047, 324.71
Total	369, 853.26	13, 482, 061.08	63, 139, 247.29	11, 762, 869.23	74, 902, 116.52
ACCOUNTABLE BALANCE JUNE 30, 1946					
Revenue due U. S. Treasury		167, 109.23	167, 116.71		167, 116.71
Security deposits	7.48	2, 448, 848.92	2, 940, 137.69		2, 940, 137.69
Clubhouse funds	309, 258.97	182, 029.80	42, 280.64		1, 680, 663.23
Money order funds		63, 893.81	68, 893.81		10, 913, 532.30
Total	309, 266.45	182, 029.80	3, 218, 428.85	12, 483, 021.08	25, 701, 449.93
Total accounted for	679, 119.71	13, 664, 090.88	66, 357, 676.14	24, 245, 890.31	90, 603, 566.45

Parentheses denotes deduction.

Includes \$3,950,000 invested in U. S. Treasury bonds; \$3,500,000 in U. S. Treasury notes; and \$400,000 in United States savings bonds, total \$9,850,000, an increase of \$400,000 in U. S. Treasury funds over the previous year.

Total per balance sheet, table No. 1, \$15,717,674.33 includes \$16,224.40 of bills in process of collection.

Custodial funds cover cash transactions which are controlled by separate fiscal regulations from those which govern the expenditure of appropriations made by Congress for maintenance and operation of The Panama Canal.

Revenue due United States Treasury covers collections for deposit as miscellaneous receipts of the United States Government which form no part of the working cash of The Panama Canal, as these funds must by law immediately be covered into the United States Treasury and relinquished from control of The Panama Canal. These collections consist mainly of tolls, licenses, court fees and fines, and amortization of public works in Panama and Colon.

Security deposits cover cash received by Canal fiscal officers from banks, individuals, and companies to guarantee payment of bills rendered by The Panama Canal and the Panama Railroad Company, and to guarantee fulfillment of contracts. Disbursements of these funds represent transfers to revenue due United States Treasury on this table, collections repayable to appropriations on the preceding table, and the return of unexpended balances to depositors.

Special deposit funds cover certain activities conducted by the Canal Zone Government separately from appropriations, principally postal money order funds, and transactions of Panama Canal club-houses maintained exclusively for employees.

TABLE No. 10.—*Accounts receivable*
REGISTERED DURING THE YEAR

	Fiscal year 1946	Fiscal year 1945
Repaid to appropriations:		
Panama Railroad Company.....	\$3,568,914.50	\$3,516,551.74
Other departments of the U. S. Government.....	9,299,430.80	14,896,509.28
Individuals and companies.....	9,702,695.18	11,662,230.94
Total.....	22,571,040.48	30,075,291.96
Miscellaneous receipts:		
Tolls.....	14,810,523.72	7,267,909.94
Public works, Republic of Panama.....	49,463.85	97,700.91
Other miscellaneous receipts.....	49.98	70.00
Total.....	14,860,037.55	7,365,680.85
Total accounts receivable registered.....	37,431,078.03	37,440,972.81
Number of bills registered.....	70,759	82,407

ACCOUNTS RECEIVABLE END OF FISCAL YEAR

Audited bills.....	\$2,539,189.06	\$3,353,013.65
Hospital certificates.....	47,798.49	45,794.91
Injury compensation.....	11,053.60	8,262.81
Unredeemed commissary coupons.....	54.00	-----
Drums, carboys, reels, and cylinders returned for credit.....	3,088.21	6,236.12
Total.....	2,601,183.36	3,413,307.49

The balance at the end of the fiscal year includes all amounts due The Panama Canal except items of utility service, principally from employees, which are not credited to earnings until collected, usually by pay-roll deductions.

TABLE NO. 11.—*Materials and supplies*

	Fiscal year 1946	Fiscal year 1945
Stock on hand, first of year:		
Balboa store.....	\$5, 510, 070. 65	\$7, 259, 265. 64
Medical store.....	283, 705. 60	391, 934. 81
Administration Bldg. store.....	63, 389. 92	51, 946. 11
Gamboa store.....	1, 686, 208. 55	1, 390, 336. 81
Cristobal store.....	1, 196, 661. 66	1, 512, 204. 45
Locks store.....	702, 576. 29	710, 644. 89
Oil handling plants.....	252, 410. 54	310, 380. 46
Panama Canal press.....	261, 020. 08	382, 774. 06
Sand and gravel pile.....	91, 710. 36	157, 447. 08
Division stores.....	635, 783. 24	715, 264. 92
Total stock value.....	10, 683, 536. 89	12, 882, 199. 23
Reserve for inventory adjustments.....	1, 723, 356. 52	2, 047, 663. 39
Book value of stock on hand.....	8, 960, 180. 37	10, 834, 535. 84
Receipts of material:		
Purchases for stock.....	6, 700, 584. 47	6, 440, 081. 56
Purchases for divisions.....	3, 137, 626. 65	3, 047, 359. 36
Local production.....	578, 246. 50	602, 652. 45
Book value of receipts.....	10, 416, 457. 62	10, 090, 093. 37
Total charges to stock.....	19, 376, 637. 99	20, 924, 629. 21
Issues and sales of material:		
Issues to Canal divisions.....	2, 899, 520. 68	3, 488, 547. 99
Issues to business divisions.....	6, 282, 226. 83	6, 606, 874. 85
Less:		
Returns to stock.....	1, 236, 233. 41	1, 246, 843. 78
Returns for resale to outsiders.....	113, 423. 12	203, 958. 52
Net issues to divisions.....	7, 832, 090. 98	8, 644, 620. 54
Sales.....	2, 173, 801. 21	3, 370, 010. 94
Total issues and sales.....	10, 005, 892. 19	12, 014, 631. 48
Adjustment of stock mark-up.....	350, 658. 26	
Price and inventory adjustments.....	242, 884. 25	194, 642. 55
Variation in division stores.....	(210, 135. 52)	79, 481. 68
Variation in reserve for inventory adjustments.....	(536, 107. 46)	(324, 306. 87)
Total credits to stock.....	9, 853, 191. 72	11, 964, 448. 84
Stock on hand, end of year:		
Balboa store.....	5, 258, 851. 56	5, 510, 070. 65
Medical store.....	287, 637. 75	283, 705. 60
Administration Bldg. store.....	57, 555. 53	63, 389. 92
Gamboa store.....	1, 674, 267. 03	1, 686, 208. 55
Cristobal store.....	1, 246, 449. 87	1, 196, 661. 66
Locks store.....	652, 960. 44	702, 576. 29
Oil-handling plants.....	357, 133. 49	252, 410. 54
Panama Canal press.....	277, 348. 03	261, 020. 08
Sand and gravel pile.....	52, 572. 87	91, 710. 36
Division stores.....	845, 918. 76	635, 783. 24
Total stock value.....	10, 710, 695. 33	10, 683, 536. 89
Reserve for inventory adjustments.....	1, 187, 249. 06	1, 723, 356. 52
Book value of stock on hand.....	9, 523, 446. 27	8, 960, 180. 37

In the foregoing table, the values of stock on hand at the beginning and end of year and receipts and issues of material are shown at invoiced cost plus an amount for procurement to cover United States inland freight, ocean freight and purchase and inspection expense.

The adjustment of stock mark-up of \$350,658.26 shown for fiscal year 1946 is due to increasing the operating mark-up from 10 to 15 percent on stock of the general storehouses as of May 1, 1946.

TABLE NO. 12.—*Work in progress*

	Fiscal year 1946	Fiscal year 1945
Electrical division.....	\$471.59	\$1,424.02
Municipal division.....	164.33	22.10
Shops and drydocks.....	278,319.84	1,395,867.58
Motor transportation division.....	2,093.97	
Building division.....	12,713.11	5,129.95
Panama Canal Press.....	5,986.71	7,776.61
Total work in progress.....	299,749.55	1,410,220.26

This account covers the amounts expended on uncompleted jobs, and will ultimately be cleared to operating expenses of the division indicated, with corresponding credits to their revenues after application of authorized charges to cover division overhead expense.

TABLE NO. 13.—*Deferred charges*

	Fiscal year 1946	Fiscal year 1945
Personnel administration.....	\$20,000.00	
Panama Canal clubhouses.....	87.78	
Physical education and recreation.....	115.50	
Atlantic locks.....	3,720.00	\$28,477.46
Dredging division.....	603,620.44	361,975.85
Experimental gardens.....	2,950.37	11,093.51
General accounts, suspense.....	219,921.93	216,235.09
Electrical work.....	507.06	4,678.77
Water system.....	2,478.00	
Municipal work.....	463.93	2,229.02
Shops and drydocks.....	75,249.53	321,464.20
Oil-handling plants.....	313.58	2,510.43
General storehouses, sundries suspense.....	2,121.50	22.79
Motor transportation division.....		6,996.36
Building division.....	34,251.24	23,559.91
Gold quarters.....	38,822.59	
Gasoline service stations.....	4,809.82	2,654.54
Public works:		
Panama.....	606,672.59	634,706.52
Colon.....	824,316.78	683,795.09
Total.....	2,440,428.64	2,300,399.54

This account covers expenses incurred for account of divisions indicated, but which are not chargeable to operating accounts of the current year. These amounts are charged as soon as values are consumed.

TABLE NO. 14.—*Capital investment*

Appropriations for Canal construction to June 30, 1921 (detail in annual report for 1924, table No. 3).....	\$386,910,301.00
Deduct value of capital stock of the Panama Railroad Company.....	7,000,000.00
Net construction appropriations.....	379,910,301.00
Annual payments to the Republic of Panama, 1913 to 1920 (State Department).....	2,000,000.00
Additional construction funds, July 1, 1921, to June 30, 1946.....	201,319,105.37
Total cash investment.....	583,229,406.37
Interest on construction funds (compounded annually) 1904 to 1920.....	128,991,063.00
Total capital investment.....	712,220,469.37

The Capital Investment Account covers the following assets, showing the total as of June 30, 1945, the increase for the current fiscal year, and the total as of June 30, 1946.

	June 30, 1945	Increase	June 30, 1946
Canal general property (table No. 2).....	\$499,949,591.30	\$1,037,112.51	\$500,986,703.81
Floating plant (table No. 3).....	9,812,272.17	64,356.03	9,876,628.20
Canal defense property.....	68,275,731.11	704,358.87	68,980,089.98
Additional facilities.....	74,312,399.96	1,677,597.18	75,989,997.14
Business fixed property (table No. 4).....	42,893,110.90	1,521,864.63	44,414,975.53
Business equipment (table No. 5).....	4,719,932.90	241,286.81	4,961,219.71
Public works, Republic of Panama (table No. 7).....	698,007.05	(698,007.05)	-----
Proportion of working capital (table No. 23).....	4,695,000.00	2,315,855.00	7,010,855.00
Total capital investment.....	705,356,045.39	6,864,423.98	712,220,469.37
Less accrued depreciation (table No. 16).....	48,523,218.74	2,801,452.13	51,324,670.87
Net capital investment.....	656,832,826.65	4,062,971.85	660,895,798.50

() denotes decrease.

The total capital investment at the close of the fiscal year 1946 amounted to \$712,220,469.37. The increase of \$6,864,423.98 is due to the making of necessary additions to plant, equipment, and working capital as shown on tables No. 2, 3, 4, 5, 7, and 23.

Interest on the net capital investment from 1921 to date is considered as a charge to operating expenses, and while this charge does not appear on the balance sheet, a statement of such interest compared with net revenues, by years, is shown on table No. 21. Interest for the current fiscal year is based upon a net capital investment of \$514,244,695.58, as of June 30, 1945, as follows, which does not include investment in Canal defense property or additional facilities, and amounts to \$15,427,340.86.

Canal general property.....	\$499,949,591.30
Floating plant.....	9,812,272.17
Business fixed property.....	42,893,110.90
Business equipment.....	4,719,932.90
Public works, Republic of Panama.....	698,007.05
Proportion of working capital.....	4,695,000.00
Total.....	562,767,914.32
Less accrued depreciation.....	48,523,218.74
Net capital investment for interest.....	514,244,695.58

TABLE No. 15.—*Accounts payable*

	Fiscal year 1946	Fiscal year 1945
United States invoices.....	(\$175,260.15)	\$948,518.32
Isthmus vouchers.....	203,087.56	276,626.54
Current pay rolls.....	2,778,276.71	3,012,871.11
Accrued salaries and wages.....	32,461.37	-----
Unpaid salaries and wages.....	31,402.11	72,887.29
Tanker freight.....	8,382.16	70,973.85
Panama Railroad freight average.....	(3,886.65)	-----
Total.....	2,874,463.11	4,381,877.11

() denotes debit balance.

The above table covers all current obligations of The Panama Canal, except deposits to guarantee payment of bills, and special deposit funds, all of which are covered by table No. 9, custodial funds.

The debit balance shown for United States invoices for the fiscal year 1946 is due to payments for purchases of materials and supplies being made at time of acceptance at factory in the United States, while charge is not taken into stock until goods are actually received on the Isthmus.

The debit balance shown for Panama Railroad freight average is due to the monthly lump-sum payment exceeding freight actually used by The Panama Canal. The monthly payment has recently been reduced and normal credit balance should be effected soon.

TABLE No. 16.—*Depreciation reserves, fiscal year 1946*

CANAL DEPRECIATION

	Balance July 1, 1945	Accruals	Retirements and trans- fers	Balance June 30, 1946
Locks.....	\$14,534,032.81	\$497,839.60	\$36,000.00	\$14,995,872.41
Madden Dam.....	519,909.93	55,085.09		604,995.02
Spillways.....	639,615.60	21,320.52		660,936.12
Aids to navigation.....	451,519.27	17,764.05		469,283.32
Wharves and piers.....	3,124,961.05	171,393.73		3,296,354.78
Dry docks.....	1,029,222.49	42,657.93		1,071,880.42
Coaling plants.....	3,904,034.42	145,308.35	73,080.00	3,976,262.77
Dredging division plant.....	592,287.77	34,728.43		627,016.20
Ferry plants.....	508,633.35	124,506.04		633,139.39
Office buildings.....	567,569.82	25,916.27		593,486.09
Gorgas Hospital.....	483,988.23	25,361.18		509,299.41
Corozal Hospital.....	130,464.10	14,367.73		144,831.83
Colon Hospital.....	106,622.85	10,604.31		117,227.16
Margarita Hospital.....		10,054.86		10,054.86
Dispensaries.....	73,710.71	6,144.78		79,855.49
Palo Seco colony.....	54,282.42	4,346.30		58,628.72
Quarantine stations.....	65,392.70			65,392.70
Other health department structures.....	35,111.98	2,051.31		37,163.29
Recreational structures.....	100,955.01	6,716.17		107,671.18
Post offices.....	17,925.77	2,967.31		20,893.08
Schoolhouses.....	361,040.96	31,826.38		392,867.34
Fire stations.....	44,537.57	2,541.34		47,078.91
Police stations.....	46,229.31	6,262.05		52,491.36
Prisons.....	11,979.72	2,020.23		13,999.95
Courthouses.....	107,435.90	3,754.65		111,190.55
Other buildings and structures.....	289,902.56	13,737.18	1,635.92	302,003.82
Silver quarters.....	93,813.21	46,461.26	2,559.39	137,715.08
Contingent reserve.....	121,210.13	174,282.95	¹ 77,025.31	218,467.74
Total, Canal depreciation.....	28,046,339.64	1,500,000.00	190,300.65	29,356,038.99

PLANT DEPRECIATION

Floating plant:				
Tugs and cranaboats.....	\$1,244,990.00	\$91,544.44		\$1,336,534.44
Launches.....	402,276.28	76,448.26	\$43,791.75	434,932.79
Dredges.....	1,952,880.00	82,860.00		2,035,740.00
Dump scows.....	1,159,027.49	39,120.00		1,198,147.49
Machine barges.....	535,856.17	52,643.74	3,532.65	584,967.26
Lighters.....	206,067.24	14,592.00		220,659.24
Launch repair barges.....	3,480.00	1,392.00		4,872.00
Anchor barges.....	2,730.00	1,560.00		4,290.00
Total, floating plant.....	5,507,307.18	360,160.44	47,324.40	5,820,143.22

¹ Residual values of following structures:

Locks storehouse, Bldg. No. 9.....	\$64,000.00
Coaling plant wharf bunker.....	13,920.00
Ferry waiting room, Bldg. No. 1095.....	880.78

Total.....	78,800.78
Less: Reduction of loss of ferryboat <i>Governor Moore</i>	1,775.44
Total.....	77,025.34

TABLE No. 16.—*Depreciation reserves, fiscal year 1946—Continued*

PLANT DEPRECIATION—Continued

	Balance July 1, 1945	Accruals	Retirements and trans- fers	Balance June 30, 1946
Business fixed property:				
Electric power system.....	\$2, 972, 379. 59	\$187, 453. 32		\$3, 159, 832. 91
Electrical work.....	70, 377. 96	9, 729. 36		80, 107. 32
Water system.....	1, 535, 389. 98	199, 778. 27	\$61, 943. 58	1, 673, 224. 67
Municipal work.....	29, 401. 43	3, 282. 00		32, 683. 43
Mechanical shops.....	1, 162, 957. 64	61, 157. 64		1, 224, 115. 28
Oil-handling plants.....	1, 140, 364. 63	73, 247. 16		1, 213, 611. 79
General storehouses.....	750, 149. 05	46, 920. 00		797, 069. 05
Motor transportation division.....	48, 553. 14	11, 166. 00	(28, 188. 00)	87, 907. 14
Motor car repair shops.....	28, 188. 00		28, 188. 00	
Building division.....	21, 558. 99	1, 683. 00		23, 241. 99
Gold quarters.....	3, 385, 401. 64	323, 119. 43	3, 600. 00	3, 704, 921. 07
Silver quarters.....	500, 207. 57		1, 290. 00	498, 917. 57
Clubhouse business structures.....	310, 371. 87	15, 136. 84	14, 790. 85	310, 717. 86
Gasoline service stations.....	22, 262. 70	2, 013. 00		24, 275. 70
Total, business fixed property.....	11, 977, 564. 19	934, 686. 02	81, 624. 43	12, 830, 625. 78
Business equipment:				
Electric power system.....	166, 174. 46	16, 104. 00		182, 278. 46
Electrical work.....	8, 197. 87	264. 00	3, 050. 30	5, 411. 57
Municipal work.....	239, 048. 00	18, 732. 74	6, 410. 00	251, 370. 74
Mechanical shops.....	1, 518, 627. 69	201, 385. 79	48, 243. 60	1, 671, 769. 88
General storehouses.....	108, 270. 34	8, 360. 16		116, 630. 50
Motor transportation division.....	729, 695. 32	156, 956. 78	(1, 869. 14)	888, 521. 24
Motor car repair shops.....	38, 938. 49		38, 938. 49	
Building division.....	105, 099. 78	11, 405. 73	(1, 415. 36)	117, 920. 87
Panama Canal Press.....	76, 540. 42	7, 419. 20		83, 959. 62
District Quartermasters' supplies.....	1, 415. 36		1, 415. 36	
Total, business equipment.....	2, 992, 007. 73	420, 628. 40	94, 773. 25	3, 317, 862. 88
Total, business fixed property and equipment.....	14, 969, 571. 92	1, 355, 314. 42	176, 397. 68	16, 148, 488. 66
Total, plant depreciation.....	20, 476, 879. 10	1, 715, 474. 86	223, 722. 08	21, 968, 631. 88

SUMMARY

Canal depreciation.....	\$28, 046, 339. 64	\$1, 500, 000. 00	\$190, 300. 65	\$29, 356, 038. 99
Plant depreciation.....	20, 476, 879. 10	1, 715, 474. 86	223, 722. 08	21, 968, 631. 88
Total depreciation.....	48, 523, 218. 74	3, 215, 474. 86	414, 022. 73	51, 324, 670. 87

The accrued balance as of June 30, 1946, of \$51,324,670.87 applies to depreciable capital assets shown on tables Nos. 3, 4, 5, and 6, amounting to \$167,285,783.94.

TABLE No. 17.—*Reserve for repairs*

	Balance July 1, 1945	Accruals	Charges	Balance June 30, 1946
Tugs and craneboats.....	\$5, 839. 87	\$143, 490. 00	\$143, 030. 86	\$6, 299. 01
Dredges.....	126, 387. 10	402, 000. 00	344, 700. 68	183, 686. 42
Dump scows.....	153, 625. 70	123, 865. 99	280, 153. 27	(2, 661. 58)
Machine barges.....	34, 711. 05	22, 280. 00	35, 742. 25	21, 248. 80
Total, floating plant.....	320, 563. 72	691, 635. 99	803, 627. 06	208, 572. 65
Electrical work, equipment.....	36, 371. 71	62, 163. 13	61, 779. 59	36, 755. 25
Total, business equipment.....	36, 371. 71	62, 163. 13	61, 779. 59	36, 755. 25
Total reserve for repairs.....	356, 935. 43	753, 799. 12	865, 406. 65	245, 327. 90

() denotes debit balance.

TABLE No. 18.—*Reserve for leave*

	Balance July 1, 1945	Accruals	Charges	Balance June 30, 1946
Electrical division.....	\$397,009.69	\$130,106.39	\$231,366.94	\$295,749.14
Municipal division.....	216,481.94	100,834.45	138,933.61	178,382.78
Shops and dry docks.....	1,195,485.47	617,289.05	1,267,581.29	545,193.23
Motor transportation division.....	263,432.16	77,851.06	125,668.81	215,614.41
Building division.....	224,972.36	99,487.24	145,927.14	178,532.46
Total reserve for leave.....	2,297,381.62	1,025,568.19	1,909,477.79	1,413,472.02

The foregoing table represents the reserve for vacation pay due employees of the principal business divisions. The reserve is credited by adding a percentage to direct labor charges for work performed by the divisions listed above to the credit of this account. The account is debited with the amount paid to employees when leave is actually taken.

TABLE No. 19.—*Deferred credits*

	Fiscal year 1946	Fiscal year 1945
Accounting department.....	\$4,041.81	\$6,941.45
Paymaster's office.....		1,350.00
Offices in the United States.....	2,900.00	29,832.20
Schools division.....	14,001.98	27,696.67
Library.....	2,236.87	500.00
Physical education and recreation.....		525.44
Police and prisons.....	5,786.43	9,521.53
Fire protection.....	1,300.00	1,591.00
District court.....	195.16	199.02
Air terminal.....	10,581.17	14,127.50
Postal service.....	188,871.22	98,273.79
Health department.....	78,071.08	112,796.95
Office engineer.....	3,836.65	2,017.65
Meteorology and hydrography.....		5,581.00
District quartermaster:		
Balboa.....	4,120.09	24,869.00
Pedro Miguel.....		2,627.00
Gamboa.....		742.00
Cocoli.....		792.00
Cristobal.....	3,556.84	3,004.00
Nautical books and charts.....	1,221.98	128.10
Port captain:		
Balboa.....	31,333.96	45,714.55
Cristobal.....	1,115.96	6,483.90
Aids to navigation subdivision.....	20,571.78	64,487.06
Pacific locks.....	27,121.72	
Atlantic locks.....		3,000.00
Dredging division.....	23,611.85	10,662.19
Special engineering division.....	140,736.34	138,710.56
General accounts, suspense.....	272,491.11	447,595.20
Exemployees' transportation differential.....	18.00	36.00
Electric power system.....	34,883.25	70,000.00
Electrical work.....	79,724.07	62,879.67
Water system.....	40,676.43	79,271.09
Municipal work.....	1,587,540.45	1,576,133.07
Shops and drydocks.....	443,096.77	803,537.85
Oil-handling plants.....	113,776.30	146,628.67
General storerooms.....	536,316.05	391,300.47
Motor-transportation division.....	45,048.50	45,948.50
Building division.....	48,508.06	96,018.95
Panama Canal Press.....	9,808.21	14,852.39
Gold quarters.....		97,274.30
Silver quarters.....	43,448.12	42,012.86
Subsistence section.....	17,072.45	17,805.11
Gasoline service stations.....	6,405.98	6,405.98
Contingencies:		
Maintenance and operation.....	53,973.61	46,015.25
Sanitation.....		814.00
Civil government.....	260.27	199.15
Total.....	3,898,160.52	4,556,903.07

This account covers expenses accrued or estimated which have been charged to operating accounts, but for which it was impracticable to institute corresponding payments at the close of the accounting period. These amounts are cleared as soon as corresponding charges are passed for payment, or contingent expenses arise.

TABLE NO. 20.—*Consolidated statement of income, expenses, and net revenues*

	Fiscal year 1946	Fiscal year 1945
Canal operations:		
Canal revenues:		
Tolls.....	\$14, 791, 807. 14	\$7, 222, 656. 14
Postal surplus.....	82, 254. 16	70, 799. 89
Other miscellaneous receipts.....	185, 430. 44	167, 915. 51
Total Canal revenues (table No. 24).....	15, 059, 491. 74	7, 461, 371. 54
Canal earnings (table No. 25).....	10, 693, 502. 16	11, 234, 499. 92
Total revenues.....	25, 752, 993. 90	18, 695, 871. 46
Canal expenses:		
Management.....	120, 358. 51	119, 074. 17
Operation and maintenance.....	13, 492, 773. 96	13, 588, 505. 17
Utilities and services.....	4, 380, 650. 23	4, 162, 381. 01
Sanitation.....	4, 692, 832. 62	4, 275, 463. 36
Civil government.....	2, 657, 291. 00	2, 517, 826. 89
Postal service.....	563, 726. 00	476, 720. 13
Total expenses.....	25, 907, 632. 32	25, 139, 970. 73
Net Canal deficit (table No. 25).....	(154, 638. 42)	(6, 444, 099. 27)
Fixed capital charge.....	14, 395, 786. 70	14, 423, 034. 44
Surplus or (deficit).....	(14, 550, 425. 12)	(20, 867, 133. 71)
Business operations:		
Business revenues.....	40, 783, 231. 51	49, 636, 205. 53
Business expenses.....	39, 906, 396. 22	48, 167, 022. 01
Net business revenues.....	876, 835. 29	1, 469, 183. 52
Fixed capital charge.....	1, 031, 554. 16	1, 052, 505. 51
Surplus or (deficit).....	(154, 718. 87)	416, 678. 01
Combined operations:		
Revenues.....	66, 536, 225. 41	68, 332, 076. 99
Expenses.....	65, 814, 028. 54	73, 306, 992. 74
Net revenues.....	722, 196. 87	(4, 974, 915. 75)
Fixed capital charge at 3 percent.....	15, 427, 340. 86	15, 475, 539. 95
Surplus or (deficit).....	(14, 705, 143. 99)	(20, 450, 455. 70)
Net capital investment (table No. 14).....	514, 244, 695. 58	515, 851, 331. 63
Combined net revenues.....	722, 196. 87	(4, 974, 915. 75)
Percent of capital return.....	. 14	(. 96)

() Denotes deficit.

A summary comparison of net revenues and capital interest, by years, from 1921 to date, is shown on table No. 21, following, together with a brief description of accounting policy governing charges to operating expenses.

Table No. 25, Canal earnings and expenses, details by function earnings and expenses for the fiscal year 1946.

TABLE NO. 21.—*Revenues, expenses, and computed surplus*

Fiscal year	Tolls	Civil revenues	Business profits	Total revenues
1914-20.....	\$33,303,581.67	\$1,206,579.86	\$536,098.34	\$35,046,259.87
1921.....	11,261,919.31	213,986.19	564,211.20	12,040,116.70
1922.....	11,193,383.47	192,208.85	323,259.16	11,708,851.48
1923.....	17,507,630.52	184,213.54	1,140,642.50	18,832,486.56
1924.....	24,289,603.16	392,250.73	901,624.12	25,583,478.01
1925.....	21,374,664.12	207,954.04	765,916.85	22,348,535.01
1926.....	22,927,456.03	217,680.50	841,310.29	23,986,446.82
1927.....	24,217,185.32	391,623.50	876,536.80	25,485,345.62
1928.....	26,943,513.11	232,532.57	736,719.43	27,912,765.11
1929.....	27,123,534.33	243,391.39	737,850.26	28,104,775.98
1930.....	27,077,117.36	349,255.35	760,971.66	28,187,344.37
1931.....	24,644,550.39	346,030.35	562,764.17	25,553,344.91
1932.....	20,706,568.49	327,444.23	557,095.44	21,591,108.16
1933.....	19,621,158.61	310,014.16	1,135,708.62	21,066,881.39
1934.....	24,065,065.16	96,666.67	1,366,755.12	25,528,486.95
1935.....	23,338,977.90	81,957.68	1,021,216.61	24,442,152.19
1936.....	23,506,806.46	119,915.21	920,185.23	24,546,906.90
1937.....	23,147,433.54	98,775.74	917,360.14	24,163,569.42
1938.....	23,215,192.39	90,335.19	824,612.60	24,130,140.18
1939.....	23,699,413.82	106,929.55	681,272.48	24,487,615.85
1940.....	21,177,243.04	118,480.75	1,033,886.06	22,329,609.85
1941.....	18,190,379.36	275,775.08	1,008,741.70	19,474,896.14
1942.....	9,772,112.42	4 219,425.29	734,465.84	10,726,003.55
1943.....	7,368,680.74	6 54,943.70	1,492,542.70	8,916,167.14
1944.....	5,473,846.30	239,393.31	1,553,294.06	7,266,533.67
1945.....	7,222,656.14	238,715.40	1,469,183.52	8,930,555.06
1946.....	14,791,807.14	267,684.60	6 207,608.91	6 15,267,100.65
Total.....	537,161,480.30	6,824,163.43	23,671,833.81	567,657,477.54

Fiscal year	Net appropriation expenses ¹	Net revenues	Capital interest 3 percent ²	Computed surplus ³
1914-20.....	\$36,657,766.89	(\$1,611,507.02)	-----	(\$1,611,507.02)
1921.....	9,578,300.14	2,461,816.56	\$14,674,964.74	(12,213,148.18)
1922.....	8,469,017.63	3,239,833.85	15,253,780.02	(12,013,946.17)
1923.....	8,240,777.56	10,591,709.00	15,202,430.18	(4,610,721.18)
1924.....	8,923,905.39	16,659,572.62	15,150,900.33	1,508,672.29
1925.....	8,666,693.44	13,681,841.57	15,099,730.49	(1,417,888.92)
1926.....	8,543,468.47	15,442,978.35	15,085,580.64	357,397.71
1927.....	9,547,715.02	15,937,630.60	15,068,580.79	869,049.81
1928.....	9,501,200.82	18,411,564.29	15,035,029.29	3,376,535.00
1929.....	10,187,150.71	17,917,625.27	15,013,374.55	2,904,250.72
1930.....	9,893,920.93	18,293,423.44	14,987,527.89	3,305,895.55
1931.....	10,693,353.53	14,859,991.38	14,986,578.04	(126,586.66)
1932.....	10,239,211.84	11,351,896.32	14,943,807.66	(3,591,911.34)
1933.....	9,555,672.02	11,511,209.37	14,907,732.16	(3,396,522.79)
1934.....	7,931,383.77	17,597,103.18	15,039,203.81	2,557,899.37
1935.....	9,481,429.57	14,960,722.62	15,124,193.39	(163,470.77)
1936.....	9,675,067.13	14,871,839.77	15,159,597.04	(287,757.27)
1937.....	10,289,624.05	13,873,945.37	15,205,397.30	(1,331,451.93)
1938.....	9,575,624.32	14,554,515.86	15,229,992.24	(675,476.38)
1939.....	10,145,272.18	14,342,343.67	15,250,404.68	(908,061.01)
1940.....	10,041,950.30	12,287,659.55	15,243,237.66	(2,955,578.11)
1941.....	9,614,117.60	9,860,778.54	15,275,108.42	(5,414,329.88)
1942.....	9,406,901.79	1,319,101.76	15,301,998.50	(13,982,896.74)
1943.....	11,268,564.39	(2,352,397.25)	15,432,220.92	(17,784,618.17)
1944.....	12,634,164.42	(5,367,630.75)	15,483,605.43	(20,851,236.18)
1945.....	13,905,470.81	(4,974,915.75)	15,475,539.95	(20,450,455.70)
1946.....	15,214,130.16	6 52,970.49	15,427,340.86	6 15,374,370.37
Total.....	297,881,854.88	269,775,622.66	394,057,856.98	(124,282,234.32)

¹ Includes adjustment of \$15,027.41 in postal surplus.² Includes adjustment of \$4,099.80 in postal surplus.³ After deduction of Canal earnings repaid to appropriations.⁴ Interest prior to July 12, 1920, is included in capital investment account.⁵ Parentheses denotes deficits.⁶ Actual business profits of \$876,835.29 have been adjusted by \$669,226.38 for write-off of reimbursable capital expenditures, public works, Republic of Panama.

The above table summarizes by classes the revenues received by The Panama Canal by fiscal years from 1921 and shows the net results from operations after deducting therefrom the net current expenses chargeable to appropriations and the current interest charge on the capital investment. The interest rate of 3 percent has been used in making computations a great many years. The use of this rate received the approval of two organizations which investigated Panama Canal matters and was formally adopted when the present accounting system was established in 1932. It has been considered a fair and reasonable rate, as the Government at various times has paid much higher rates for the use of money.

Interest chargeable to operations is not included on the balance sheet and no interest charge against the Canal is actually made by the United States Treasury.

Total revenues on the foregoing statement represent receipts which must be covered into the United States Treasury and relinquished from control of The Panama Canal. Earnings repayable to Canal appropriations, and reexpendable by the Canal, are deducted from gross operating expenditures, in order to present a comparison of funds covered into the Treasury with funds chargeable to operating account, exclusive of capital additions.

The absence of tax charges is compensated for by the inclusion in Canal operating accounts of the direct costs of civil government, health and welfare activities. Neither capital nor operating expenses of The Panama Canal include the cost of the military and naval establishments on the Isthmus; however, all important exchanges of services with those interests are covered by cash settlements, or reciprocal allowances.

By including in the accounts all revenues properly applicable to Canal activities and by charging against the total revenue the net appropriation expenses including charges for depreciation and interest at 3 percent on the capital invested but excluding any charge to amortize the investment, there has accumulated as of June 30, 1946, as shown by the above table, a deficit of \$124,282,234.32.

TABLE No. 22.—*Capital refundments*

Balance June 30, 1945.....	\$287, 415, 427. 79
Cash covered into U. S. Treasury.....	16, 454, 031. 77
Business profits (table No. 8).....	\$1, 429, 812. 59
Revenue due U. S. Treasury (table No. 9).....	15, 024. 219. 18
Total.....	303, 869, 459. 56
Appropriations, fiscal year 1946 (detail below).....	\$7, 575, 308. 26
Less: Net capital additions, current year (table No. 14).....	6, 864, 423. 98
Net appropriation for operating account and incomplete construction.....	710, 884. 28
Net capital refundments, June 30, 1946.....	303, 158, 575. 28

TABLE No. 22.—*Capital refundments*—ContinuedSCHEDULE OF OPERATING APPROPRIATIONS¹

Fiscal year	Maintenance and operation	Sanitation	Civil government	Construction additional facilities	Miscellaneous	Annual payment to Panama	Total
1914 to 1928.....	\$83,826,211	\$9,379,482	\$11,160,470	-----	² \$151,344.55	³ \$2,000,000	\$106,517,507.55
1929.....	6,832,000	722,000	1,172,400	-----	-----	250,000	8,976,400.00
1930.....	8,000,000	820,000	1,201,000	-----	-----	250,000	10,271,000.00
1931.....	10,162,470	753,900	1,295,190	-----	-----	250,000	12,461,560.00
1932.....	9,359,808	782,189	1,351,689	-----	-----	250,000	11,743,686.00
1933.....	11,891,011	755,650	1,300,000	-----	-----	250,000	14,196,661.00
1934.....	11,172,700	698,426	1,235,278	-----	⁴ 1,150,000.00	430,000	14,686,404.00
1935.....	4,971,490	768,501	792,935	-----	-----	430,000	6,962,926.00
1936.....	6,900,000	874,616	1,022,981	-----	-----	430,000	9,227,597.00
1937.....	9,149,201	899,793	1,073,950	-----	-----	430,000	11,552,944.00
1938.....	8,519,000	918,000	1,131,760	-----	⁵ 5,000.00	430,000	11,003,760.00
1939.....	8,149,000	933,800	1,167,325	-----	⁶ 155,000.00	430,000	10,835,125.00
1940.....	22,823,087	1,004,535	1,180,802	-----	⁷ 36,307.87	430,000	25,474,731.87
1941.....	38,292,667	1,045,393	1,192,011	\$15,000,000	⁷ 325,000.00	430,000	56,285,071.00
1942.....	29,595,286	1,635,223	1,295,017	34,932,000	-----	430,000	67,887,526.00
1943.....	40,152,437	1,692,800	1,609,373	56,826,800	⁸ 277,000.00	430,000	100,988,410.00
1944.....	6,016,000	1,814,000	1,228,100	⁹ (30,257,572)	⁸ (40,000.00)	430,000	(20,809,472.00)
1945.....	5,850,000	1,854,000	1,476,400	-----	-----	430,000	9,610,400.00
1946.....	¹⁰ (276,000)	2,261,200	1,756,000	¹¹ 3,428,600	⁸ (24,491.74)	430,000	7,575,308.26
Total.....	321,386,368	29,613,508	33,642,681	79,929,828	2,035,160.68	8,840,000	475,447,545.68
Less: Net capital additions, 1922 to 1946 (table No. 14).....	-----	-----	-----	-----	-----	-----	201,319,105.37
Net appropriation for Canal maintenance and operation and incomplete construction.....	-----	-----	-----	-----	-----	-----	274,128,440.31

¹ Operating appropriations include authorization for capital construction.² Appropriations for increase in compensation.³ Covers payments to Panama 1921 to 1928. Payments from 1913 to 1920 charged to cost of construction. \$2,000,000.⁴ N. R. A. \$1,000,000; Repatriation of unemployed aliens, \$150,000.⁵ Appropriation for memorial to Maj. Gen. George W. Goethals.⁶ Navy appropriation for frequency changer, Balboa.⁷ Appropriation for construction of Trans-Isthmian Highway.⁸ Transfer from Public Works Administration, Federal Works Agency, for recreational facilities; \$64,491.74 refunded.⁹ Refunded to the U. S. Treasury in accordance with proviso "That \$30,257,572. of the appropriation 'Construction, additional facilities, Panama Canal' is hereby repealed" (1945 appropriation act, Public Law 352, approved June 26, 1944).¹⁰ Appropriation for 1946 of \$4,724,000 less \$5,000,000 refunded to the U. S. Treasury in accordance with First Supplemental Surplus Appropriation Rescission Act, 1946, Public Law 301, approved February 18, 1946.¹¹ Includes \$1,118,000 for fiscal year 1947 made available in fiscal year 1946 and \$1,500,000 also included in the 1947 appropriation act for Canal studies and made immediately available.

The total deposits covered into the United States Treasury from the beginning of Canal construction, with minor adjustments to reconcile changes in accounting process, amount to \$577,287,015.59, and deducting therefrom net appropriations for operation and incomplete construction amounting to \$274,128,440.31, as shown above, produces the net capital refundment balance of \$303,158,575.28. Deposits covered into the Treasury consist principally of the earned revenues cited in table No. 21, which total \$567,657,477.54, the balance being made up of sales of property, principally during the construction period, and return of appropriation balances.

Although above table shows a net cash refundment of \$303,158,575.28, such refundment is not deductible from net capital investment as shown in table No. 14, which is considered as measuring the value of the Panama Canal as an instrument of public utility upon which a perpetual return should be earned; furthermore, annual interest on net asset valuation chargeable to operating account is not included in cash transactions with the United States Treasury. Such interest at 3 percent from 1921 to 1946, would have amounted to \$394,057,-

856.98, as shown in table No. 21, and would have extinguished all capital refundments to date, if such interest charges had been assessed against Canal revenues.

TABLE NO. 23.—*Balance of revenues and refundments*

DEBITS	
Revenue due U. S. Treasury (table No. 9)-----	¹ \$183, 341. 11
Appropriated cash in U. S. Treasury (table No. 8)-----	12, 212, 375. 56
Appropriated cash with fiscal officers (table No. 8)-----	6, 123, 472. 31
Accounts receivable (table No. 10)-----	2, 601, 183. 36
Stores (table No. 11)-----	9, 523, 446. 27
Work in progress (table No. 12)-----	299, 749. 55
Deferred charges (table No. 13)-----	2, 440, 428. 64
Total debits-----	33, 383, 996. 80
CREDITS	
Accounts payable (table No. 15)-----	2, 874, 463. 11
Reserve for repairs (table No. 17)-----	245, 327. 90
Reserve for leave (table No. 18)-----	1, 413, 472. 02
Deferred credits (table No. 19)-----	3, 898, 160. 52
Total credits-----	8, 431, 423. 55
Net current accounts-----	24, 952, 573. 25
Less proportion under capital investment (table No. 14)----	7, 010, 855. 00
Balance-----	17, 941, 718. 25

¹ Includes \$16,224.40 of bills in process of collection.

A revolving fund now totaling \$7,010,855 is set up in Canal accounting for working capital. This amount is an increase during the fiscal year 1946 of \$2,510,855 under the appropriation "Maintenance and operation, Panama Canal," to cover increased investment in stock of materials and supplies and a reduction of \$195,000 under the appropriation "Sanitation, Canal Zone, Panama Canal," restored to the current year's operating fund.

This revolving fund is credited to capital investment account in addition to funds used for construction and equipment, the total constituting the base for capital interest computations. Net working capital in excess of the revolving fund is considered as a temporary advance of Treasury funds, but is usually less than appropriated funds not withdrawn from the Treasury. Working capital investments are in constant process of accrual and liquidation for account of the United States Treasury.

Due to war emergency, the debit balances under working capital are abnormally large.

TABLE NO. 24.—*Canal revenues*

	Fiscal year 1946	Fiscal year 1945
Tolls-----	\$14, 791, 807. 14	\$7, 222, 656. 14
Postal surplus-----	82, 254. 16	70, 799. 89
Licenses, fees, fines, etc-----	177, 384. 27	167, 040. 88
Miscellaneous-----	8, 046. 17	874. 63
Total-----	15, 059, 491. 74	7, 461, 371. 54

Canal revenues shown above comprise earnings which by law must be covered into the United States Treasury as miscellaneous receipts, United States revenues, and relinquished from control of The Panama Canal, as distinguished from earnings repayable to Canal appropriations shown on tables No. 25 and 26.

TABLE No. 25.—*Canal earnings and expenses*

	Expenses	Earnings	Net expenses
Maintenance and operation:			
Management:			
Office of—			
Governor.....	\$25, 235. 16	\$8, 595. 00	\$16, 640. 16
Engineer of maintenance.....	53, 977. 42	11, 238. 00	42, 739. 42
Comptroller and budget officer.....	41, 145. 93	13, 516. 04	27, 629. 89
Total.....	120, 358. 51	33, 349. 04	87, 009. 47
Canal operation and maintenance:			
Office of assistant engineer of maintenance.....	21, 618. 41	6, 139. 00	15, 479. 41
Locks operation and maintenance.....	2, 181, 467. 14	-----	2, 181, 467. 14
Locks quadrennial overhaul.....	136, 216. 74	-----	136, 216. 74
Office engineering division.....	560, 100. 91	455, 858. 12	104, 242. 79
Section of meteorology and hydrography.....	45, 411. 52	21. 00	45, 390. 52
Marine division.....	3, 382, 838. 51	2, 391, 310. 28	991, 528. 23
Dredging division.....	5, 158, 166. 76	2, 227, 083. 15	2, 931, 083. 61
Dams, reservoirs, and spillways.....	76, 953. 97	-----	76, 953. 97
Depreciation on Canal general property.....	1, 500, 000. 00	-----	1, 500, 000. 00
Annual payment to Republic of Panama.....	430, 000. 00	-----	430, 000. 00
Total.....	13, 492, 773. 96	5, 080, 411. 55	8, 412, 362. 41
Utilities and services:			
Public buildings and grounds.....	771, 869. 60	438, 912. 40	332, 957. 20
Highways.....	606, 507. 86	-----	606, 507. 86
Sewers.....	33, 683. 45	-----	33, 683. 45
Air terminal.....	76, 807. 39	74, 699. 50	2, 107. 89
Personnel administration.....	913, 024. 76	459, 555. 93	453, 468. 83
General correspondence and records.....	210, 573. 72	102, 355. 00	108, 218. 72
Office of general counsel.....	26, 742. 93	14, 284. 00	12, 458. 93
Offices of paymaster and collector.....	158, 167. 90	106, 817. 75	51, 350. 15
Accounting department.....	912, 279. 80	644, 541. 80	267, 738. 00
Offices in the United States.....	670, 992. 82	343, 460. 82	327, 532. 00
Total.....	4, 380, 650. 23	2, 184, 627. 20	2, 196, 023. 03
Total maintenance and operation.....	17, 993, 782. 70	7, 298, 387. 79	10, 695, 394. 91
Sanitation:			
Chief health office.....	80, 293. 93	-----	80, 293. 93
Hospitals.....	2, 952, 557. 76	1, 288, 698. 64	1, 663, 859. 12
Dental clinics.....	62, 596. 15	90, 852. 69	(28, 256. 54)
Venereal disease clinics.....	179, 072. 17	-----	179, 072. 17
Dispensaries.....	300, 609. 70	168, 364. 00	132, 245. 70
Cemeteries.....	37, 110. 35	10, 210. 50	26, 899. 85
Quarantine and immigration.....	153, 983. 80	105, 064. 15	48, 919. 65
Sanitation.....	926, 608. 76	574, 411. 99	352, 196. 77
Total sanitation.....	4, 692, 832. 62	2, 237, 601. 97	2, 455, 230. 65
Civil government:			
Office of executive secretary.....	32, 284. 02	2, 585. 00	29, 699. 02
Civil affairs division.....	241, 368. 86	46, 452. 67	194, 916. 18
License bureau.....	28, 030. 38	4, 500. 00	23, 530. 38
Schools.....	791, 507. 23	83, 107. 23	708, 400. 00
Library.....	47, 869. 14	6, 789. 98	41, 079. 16
Physical education and recreation.....	159, 277. 40	19, 157. 28	140, 120. 12
Police section.....	1, 002, 638. 56	323, 894. 84	678, 743. 72
Fire section.....	316, 432. 04	107, 299. 40	209, 132. 64
Courts.....	37, 883. 38	-----	37, 883. 38
Total civil government.....	2, 657, 291. 00	593, 786. 40	2, 063, 504. 60
Postal service.....	563, 726. 00	1 563, 726. 00	-----
Net Canal expenses.....	25, 907, 632. 32	10, 693, 502. 16	15, 214, 130. 16

SUMMARY

Canal revenues (table No. 24).....	-----	-----	\$15, 059, 491. 74
Net Canal expenses.....	-----	-----	15, 214, 130. 16
Net Canal deficit (table No. 20).....	-----	-----	(154, 638. 42)

() Denotes credit.

¹ After transfer of \$82,254.16 to surplus account and included on table No. 20.

The earnings of the divisions engaged in the transiting of vessels through the Canal, as well as earnings of sanitation and civil government divisions, are deducted from gross expenses to arrive at the net expenditure from Canal appropriations, which in turn is deducted from Canal revenues to arrive at net Canal deficit, exclusive of business division profits.

Earnings of the executive offices and accounting department represent principally a proportional charge against business divisions of The Panama Canal and the Panama Railroad Company. Business divisions are reimbursed for this proportional expense by adding a surcharge to the direct cost on all work performed. The Panama Railroad's proportion is distributed to the various units of that organization.

The earnings of the offices in the United States comprise charges against business storehouses operations to cover a proportional part of the cost of purchasing, inspection, and handling of material used by business divisions or sold to outside interests, which expense is covered through surcharges added to the price of material.

TABLE NO. 26.—*Business expenses, revenues, and profit or loss*

	Expenses	Revenues	Profit or loss
Electric power system.....	\$1,061,305.04	\$1,404,090.55	\$342,785.51
Electrical work.....	1,906,426.45	1,910,634.46	4,208.01
Water system.....	876,769.67	1,059,713.30	182,943.63
Municipal work.....	2,613,934.84	2,629,331.80	15,396.96
Sosa Hill rock crusher and batching plant.....	460,615.75	477,254.45	16,638.70
Mechanical division.....	10,751,145.68	10,751,145.68	-----
Wharves and piers.....	35,619.44	139,500.00	103,880.56
Oil handling plants.....	2,042,160.43	2,101,440.29	59,279.86
General storehouses.....	9,878,898.62	9,878,898.62	-----
Motor transportation division.....	1,905,180.25	1,919,689.91	14,509.66
Building division.....	4,251,499.23	4,268,083.43	16,584.20
Panama Canal Press.....	465,375.20	475,756.75	10,381.55
Gold quarters.....	1,285,768.87	1,285,768.87	-----
Silver quarters.....	515,192.84	515,192.84	-----
Subsistence section.....	614,377.95	614,377.95	-----
Gasoline service stations.....	325,910.29	350,653.76	24,743.47
Sand and gravel operations.....	65,865.25	70,665.25	4,800.00
Rental, Hotel Tivoli.....	-----	60,000.00	60,000.00
Public Works:			
Panama.....	536,425.65	550,432.10	14,006.45
Colon.....	313,924.77	320,601.50	6,676.73
Total.....	39,906,396.22	40,783,231.51	876,835.29

The profits on business operations as above, amounting to \$876,-835.29, compare with profits in 1945 of \$1,469,183.52.

Profits on public works, Panama and Colon, amounting to \$20,-683.18 represent interest which has been currently reported for coverage into general funds of the United States Treasury. The balance of the total profits, amounting to \$856,152.11, will be immediately covered into the Treasury as miscellaneous receipts, United States revenues, in accordance with regulations.

Business operations of The Panama Canal are conducted separately from operating activities pertaining directly to the transiting of vessels, and government of the Canal Zone. The annual appropriation acts for The Panama Canal authorize the use of appropriated funds for the conduct of auxiliary business activities, provided that funds so advanced are recovered through earnings, and with the further proviso that any net profit derived from such business activities be covered annually into the United States Treasury.

TABLE No. 27.—*Balances in appropriations and funds, June 30, 1946*

	U. S. Treasury appropriations	Cash on hand	Accounts receivable	Transfers available	Work in progress and suspense	Storehouse stock	Total
ASSETS							
Maintenance and operation, Panama Canal	\$7,434,521.03	\$4,755,746.40	\$2,402,649.39	\$354,053.97	\$2,524,063.01	\$5,157,719.73	\$26,638,753.53
Sanitation, Canal Zone, Panama Canal	36,130.36	334,976.38	182,308.14			354,548.12	907,972.00
Civil government, Panama Canal and Canal Zone	70,941.68	127,073.75	6,916.28	20,311.02	115.50	11,178.42	236,536.65
Postal funds, Canal Zone (special fund)	236,042.30	202,832.72	4,000.00				442,875.02
Repatriation of unemployed aliens, Panama Canal	45,000.00	10,883.78		85.73			55,969.51
Memorial to Maj. Gen. George W. Goethals	156,508.58				3,491.42		160,000.00
Construction, additional facilities, Panama Canal	4,233,222.61	621,269.28	5,309.55				4,859,801.44
Working funds, Panama Canal: Hospitalization of military personnel		60,690.00					60,690.00
Transfer from defense public works, Federal Works Agency, community facilities		167,116.71	16,224.40	856,152.11	212,508.26		212,508.26
Miscellaneous receipts, United States revenues							1,039,493.22
Total	12,212,375.56	6,290,589.02	2,617,407.76	1,230,602.83	2,740,178.19	9,523,446.27	34,614,599.63
LIABILITIES							
	Working capital allotment	Accounts payable	Transfers payable	Special liabilities	Funded reserves	Appropriation balance	Total
Maintenance and operation, Panama Canal	\$6,520,855.00	\$2,260,381.72	\$856,152.11	\$3,466,701.17	\$7,383,526.19	\$6,151,137.34	\$26,638,753.53
Sanitation, Canal Zone, Panama Canal	480,000.00	335,632.00	27,967.97	43,352.08		969.35	907,972.00
Civil government, Panama Canal and Canal Zone	10,000.00	170,264.17		23,780.71		32,491.77	236,536.65
Postal funds, Canal Zone (special fund)		37,369.72	6,451.74	188,871.22		210,182.34	442,875.02
Repatriation of unemployed aliens, Panama Canal		200.00	380.72			55,969.51	55,969.51
Memorial to Maj. Gen. George W. Goethals						160,000.00	160,000.00
Construction, additional facilities, Panama Canal		50,594.90	313,639.29	140,736.34		4,354,833.91	4,859,801.44
Working funds, Panama Canal: Hospitalization of military personnel			26,001.00				60,690.00
Transfer from Defense Public Works, Federal Works Agency, community facilities		1,039,493.22		34,689.00		212,508.26	212,508.26
Miscellaneous receipts, United States revenues							1,039,493.22
Total	7,010,855.00	3,913,956.33	1,230,602.83	3,898,160.52	7,383,526.19	11,177,495.76	34,614,599.63

This table shows the status of Panama Canal working capital by the various appropriations and funds by which it is separately accountable under existing laws and Treasury regulations.

A revolving fund of \$7,010,855.00 is set aside in Canal accounting to cover the net investment in current accounts, which sum is included in the capital investment account (table No. 14).

The following table shows the detail of the funded reserves stated in the foregoing table as \$7,383,526.19.

TABLE NO. 28.—*Funded reserves, fiscal year 1946*

	Adjusted balance July 1, 1945	Accruals	Expenditures	Balance June 30, 1946
Marine division:				
Tugs.....	¹ \$236,926.95	¹ \$40,904.44		¹ \$277,831.39
Launches.....	55,665.68	55,484.26		75,314.79
<i>Emerald</i> (completed).....			\$26,676.09	
<i>Quail</i> (part).....			9,159.06	
Machine barges.....	13,087.43			13,087.43
Launch repair barges.....	3,480.00	1,392.00		4,872.00
Total.....	309,160.06	97,780.70	35,835.15	371,105.61
Dredging division:				
Tugs and crane boats.....	¹ 79,446.49	50,640.00		130,086.49
Launches.....	89,665.82	20,964.00		110,629.82
Dredges.....	776,020.00	82,860.00		858,880.00
Dump scows.....	109,379.58	39,120.00		148,499.58
Machine barges.....	12,921.65	52,643.74		65,565.39
Lights.....	15,366.40	14,592.00		29,958.40
Anchor barges.....	2,730.00	1,560.00		4,290.00
Total.....	1,085,529.94	262,379.74		1,347,909.68
Total, transit divisions.....	1,394,690.00	360,160.44	35,835.15	1,719,015.29
Electric power system:				
Hydroelectric plant, Gatun.....	54,821.95	32,520.00		87,341.95
Diesel-electric plant, Miraflores.....	² 187,478.50	64,044.00		251,522.50
Substations.....	301,672.62	36,109.32		337,781.94
Transmission system.....	32,878.27	23,520.00		56,398.27
Madden system.....	117,369.37	31,260.00		148,629.37
Electric ranges.....	186,501.80	16,104.00		202,605.80
Total.....	880,722.51	203,557.32		1,084,279.83
Electrical work:				
Fixed property.....	51,412.40	9,729.36		61,141.76
Equipment.....	6,814.15	264.00		7,078.15
Total.....	58,226.55	9,993.36		68,219.91
Water system:				
Pump station buildings.....	(5,707.47)	7,332.00		1,624.53
Pump station machinery.....	77,282.71	26,100.00		103,382.71
Filter plant buildings.....	56,227.73	26,280.00		82,507.73
Filter plant machinery.....	86,082.73	15,117.00		101,199.73
Reservoirs and tanks.....	14,427.80	53,117.27		67,545.07
Pipe lines:				
Large mains.....	209,707.34	31,092.00		60,824.98
Clean and reline 30- and 36-inch main, Gamboa to Miraflores.....			179,974.36	
Distribution.....	6,259.57	40,740.00		5,819.48
Ancon.....			28,607.86	
Balboa.....			12,572.23	
Total.....	444,280.41	199,778.27	221,154.45	422,904.23
Municipal work:				
Fixed property.....	25,956.10	3,282.00		29,238.10
Equipment.....	70,595.81	18,732.74	10,715.00	78,613.55
Total.....	96,551.91	22,014.74	10,715.00	107,851.65

See footnotes at end of table.

TABLE No. 28.—*Funded reserves, fiscal year 1946*—Continued

	Adjusted balance July 1, 1945	Accruals	Expenditures	Balance June 30, 1946
Mechanical shops:				
Fixed property:				
Balboa shops.....	\$123,808.52	\$43,707.29	-----	\$167,515.81
Balboa railroad shops.....	59,313.69	6,265.39	-----	65,579.08
Cristobal shops.....	110,975.53	11,184.96	-----	122,160.49
Equipment:				
Balboa.....	387,147.09	140,722.82	\$228,489.06	299,380.85
Cristobal.....	241,904.40	60,662.97	30,736.61	271,830.76
Total.....	923,149.23	262,543.43	259,225.67	926,466.99
Oil-handling plants:				
Balboa:				
Pumping plant.....	52,149.37	4,293.84	-----	52,040.75
400-horsepower steam boiler.....	-----	-----	4,402.46	-----
Storage tanks.....	48,588.69	8,881.44	-----	57,470.13
Pipe lines.....	64,847.69	17,037.48	-----	81,885.17
Dock No. 4.....	19,800.00	3,300.00	-----	23,100.00
Cristobal:				
Pumping plant.....	52,372.79	4,317.72	-----	54,505.94
400-horsepower steam boiler.....	-----	-----	2,184.57	-----
Storage tanks.....	17,257.95	10,624.68	-----	27,882.63
Pipe lines.....	201,081.81	24,792.00	-----	225,873.81
Total.....	456,098.30	73,247.16	6,587.03	522,758.43
General storehouses:				
Fixed property.....	159,799.69	46,920.00	-----	206,719.69
Equipment.....	24,487.28	8,360.16	-----	32,847.44
Total.....	184,286.97	55,280.16	-----	239,567.13
Motor transportation division:				
Transportation:				
Fixed property.....	17,055.80	6,810.00	-----	23,865.80
Motor vehicles.....	130,466.65	155,193.18	55,449.59	230,210.24
Repair shops:				
Fixed property.....	38,189.33	4,356.00	-----	42,545.33
Equipment.....	19,963.31	1,763.60	-----	21,726.91
Total.....	205,675.09	168,122.78	55,449.59	318,348.28
Building division:				
Fixed property.....	15,110.06	1,683.00	-----	16,793.06
Equipment.....	³ 13,749.46	11,405.73	4,419.80	20,735.39
Total.....	28,859.52	13,088.73	4,419.80	37,528.45
Panama Canal Press, equipment.....	24,315.62	7,419.20	-----	31,734.82
Gold quarters:				
Fixed property.....	751,428.54	323,119.43	-----	431,311.02
Alterations and improvements.....	-----	-----	39,012.39	-----
Preliminary plans and studies.....	-----	-----	13,566.52	-----
New construction.....	-----	-----	590,658.04	-----
Total.....	751,428.54	323,119.43	643,236.95	431,311.02
Silver quarters, fixed property.....	10,717.02	-----	-----	7,711.99
Alterations and improvements.....	-----	-----	3,005.03	-----
Total.....	10,717.02	-----	3,005.03	7,711.99
Gasoline service stations, fixed property.....	22,412.70	2,013.00	-----	24,425.70
Clubhouse business structures, fixed property.....	17,465.71	15,136.84	-----	32,602.55
Total, business divisions.....	4,104,190.08	1,355,314.42	1,203,793.52	4,255,710.98
Total reserve for replacements.....	5,498,880.08	1,715,474.86	1,239,628.67	5,974,726.27
Total reserve for repairs (Table No. 17).....	356,935.43	753,799.12	865,406.65	245,327.90
Total reserve for leave ⁴ (Table No. 18).....	2,047,381.62	1,025,568.19	1,909,477.79	1,163,472.02
Total funded reserves (Table No. 27).....	7,903,197.13	3,494,842.17	4,014,513.11	7,383,526.19

¹ Adjusted balance after transfer of \$2,850 from marine division to dredging division due to transfer of tug *Diablo*.

² Adjusted balance after transfer of \$11,249.18 from gasoline service stations equipment.

³ Adjusted balance after transfer of \$4,083.32 from district quartermasters' supplies due to transfer of mattress factory operations.

⁴ Less \$250,000 transferred to replacement funds.

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